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ABSTRACT

The goal of this book is to help teachers deal more effectively with national security topics in their economics courses. The lessons are designed to introduce national security ideas and concepts into the classroom by filling gaps in textbook coverage and enriching current textbook treatment of national security topics. The lessons are grouped into six sections corresponding to major divisions of subject matter in a high school economics course. Section 1 contains eight lessons dealing with fundamental economic concepts. Section 2 has five lessons on topics illustrating microeconomic concepts related to markets, supply, and demand. Section 3 contains six lessons on microeconomic concepts related to market structure and market failure. Section 4 presents six lessons on various macroeconomic concepts. Section 5 includes five lessons dealing with international economic concepts. Section 6 contains four lessons relevant to economic decision making and measurement concepts. Each lesson includes (1) a description of the main points, (2) economic concepts to be taught, (3) instructional objectives, (4) suggested teaching procedures, (5) ways to integrate lessons with the textbook, (6) exercises and application activities on reproducible handouts for student, and (7) suggested readings. (SM)

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ECONOMICS AND NATIONAL SECURITY

Supplementary Lessons for High School Courses

Steven L. Miller, Volume Editor
Richard C. Remy, Series Editor

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NATIONAL SECURITY IN THE NUCLEAR AGE SERIES

Supplementary Lessons for High School Courses

American History and National Security
American Government and National Security
Economics and National Security
World History and National Security
World Geography and National Security

Also

Essentials of National Security: A Conceptual Guidebook for Teachers

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ECONOMICS AND NATIONAL SECURITY

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Economics and National Security

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PREFACE

National security is a vital concern increasingly shared by young people and adults alike. In a world of opposing values and interests, armed nations continue to seek control over their own affairs and to influence others. And as the human race has developed the capacity for self-annihilation through weapons of mass destruction, so too have average citizens begun to think seriously about the threat of nuclear war and a wide array of accompanying issues.

In the American system of government, it is imperative that citizens understand and participate constructively in the debates about public issues, and especially those that so vitally affect the entire human race. Yet it has been these very issues that many have felt least able to influence, since they thought that only "experts" could understand the complexities of security policy.

To prepare for citizen participation, individuals must develop the knowledge and the skills necessary to be responsible citizens. Since the turn of the century citizen education has been the main purpose of the social studies curriculum. There can be no more vital public policy issue in that curriculum than the question of our survival and well-being in the nuclear age. Consequently social studies educators recognize their special obligation for preparing students for meaningful participation in today's world.

The National Security in the Nuclear Age (NSNA) Project has been designed to provide for the systematic inclusion of the subject of national security into American high schools. The first steps undertaken to meet this goal were the development of instructional materials for the social studies curriculum and the training of educators in both the content and pedagogy of national security studies as it relates to the curriculum.

From its inception in 1983 NSNA has closely collaborated with those responsible for implementing new ideas in the classroom. Secondary school teachers and curriculum specialists, including social studies consultants of state education agencies, have been continuously involved in the planning and development of NSNA activities. In June 1983, representatives from 43 state education agencies met with the NSNA leadership to assess the state of education about national security and to give advice about school needs. This group of statewide leaders and other social studies educators have continued to provide valuable input into how university-generated knowledge in both national security studies and educational change strategies can best be applied in assisting schools to do a better job of teaching social studies.

Major activities of NSNA have been carried out with the support of the Ford Foundation (International Affairs Program) which funded the meetings with education leaders and the development of the six print products found in this series. Additional support has been received from the W. Alton Jones Foundation to build upon the initial efforts of NSNA, specifically to create a plan for a national center that will allow the Mershon Center's Citizenship Development for a Global Age Program, the home of NSNA, to provide a comprehensive and continuing program of support activities for educators across the nation.

Two types of instructional materials have been developed by the NSNA Project. One of them, Essentials of National Security: A Conceptual Guidebook for Teachers, has been written by national security specialists and is designed principally as a teacher resource. It provides a conceptual outline of the field of security studies, in short, a road map for the educator who wants to learn about the field but who brings no special expertise. The second type of product is a series of five books, of which this book is one, each comprising approximately 34 lessons, designed to be infused into standard high school social studies courses (American history, American government, world history, world geography and economics). A full discussion of how these books of lessons can be used is found in the section, "Introduction For Teachers" (pages vii-xii).

We wish to thank a number of individuals who have played an instrumental role in this project. First, we are grateful to Enid

Schoettle of the Ford Foundation who offered initial encouragement and continuing guidance, and to her colleague Gary Sick. In addition to the normal kinds of support provided by program officers, they lent their considerable expertise in the field of national security studies to help us design a better strategy for meeting the needs of educators. Jeffrey Kelleher of the W. Alton Jones Foundation also provided financial support during the past year that has sustained the vitality of our commitment to pre-collegiate education about national security. A note of special thanks is also due Charles F. Hermann, Director of the Mershon Center, who has allowed us to take full advantage of the Center's physical and intellectual capacities.

Recognition is due Marie Hoguet who served as the Project's Administrative Assistant and coordinated our Washington office during 1985 and part of 1986, and Mark Denham who served in the same capacity since the move of NSNA headquarters to the Mershon Center in summer 1986. Saundra Jones competently performed a myriad of duties as the assistant to Richard Remy, the editor of this series. Edith Bivona and Peggy Robinson provided a number of essential secretarial services to the Project. Patricia Geschwent deserves special recognition for her tireless and creative efforts to make full use of a new computer word processing system to format and produce this book.

The Project owes its gratitude to a multitude of educators who have offered suggestions and inspiration at countless workshops across the nation. Deserving of special mention is the Council of State Social Studies Supervisors (CS-4) whose members participated in the design of the Project and who offered critical advice on numerous occasions throughout. Members of our National Advisory Board provided helpful suggestions on the design and format of the lessons. George Grantham of the U.S. Department of Defense Dependents Schools, Germany Region, provided the opportunity for an in-depth workshop with teachers from high schools throughout the Germany Region. We derived many helpful comments from the participants in that workshop. Louis Grigar of the Texas Education Agency provided a similar opportunity with social studies supervisors from Texas. Especially to be thanked are the educators who field tested and reviewed all the lessons in this volume:

Steve Buckles, University of Missouri
June Gilliard, Joint Council on Economic Education, New York
Phyllis Harris, Upper Arlington High School, Upper Arlington, Ohio
John Morton, Governors State University, Illinois
Dave Parrish, Northland High School, Columbus, Ohio
Ray Pauken, Coordinator for Economic Instruction, Columbus Public Schools, Columbus, Ohio
Mike Rigley, De Sales High School, Columbus, Ohio
Pat Wax, Worthington High School, Worthington, Ohio

Each of the lessons in this volume was also reviewed by at least one national security specialist. The scholars who reviewed lessons include:

Linda P. Brady, Emory University
John L. Gaddis, Ohio University
Robert C. Gray, Franklin & Marshall College
James E. Harf, The Ohio State University
William H. Kincade, Georgetown University
Joseph J. Kruzel, The Ohio State University
Michael Mandelbaum, The Lehrman Institute
Andrew G. Oldenquist, The Ohio State University
B. Thomas Trout, The University of New Hampshire

Finally, as Senior Consultant on Curriculum Development for the series John Patrick provided invaluable counsel that helped steer the development process to a successful conclusion.

The goal of all associated with the NSNA Project has been to help teachers advance young people's knowledge and intellectual skills in preparation for responsible citizenship. We offer this volume as one contribution to achieving that goal.

James E. Harf
William H. Kincade
Richard C. Remy
B. Thomas Trout

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INTRODUCTION FOR TEACHERS

by Richard C. Remy

This is a book for high school teachers of economics. Teachers of government may also find several lessons in this book useful. The book contains 33 lessons for teachers to use with their students. Each lesson contains material relating to economics and national security such as a case-study, or a set of data, or excerpts from a primary source that can be readily duplicated for student use. Each lesson also contains suggestions for the teacher on how to use the material. *Permission is granted to teachers to make copies of these lessons for use with their students.*

Purpose of the Lessons

The purpose of this book is to help teachers strengthen education about national security concepts and issues in their economics course. The lessons presented here do not duplicate textbook content. Nor are they presented as a comprehensive survey of the field of national security. Rather, they are designed to introduce national security ideas and concepts into the classroom by:

- filling gaps in textbook coverage,
- enriching current textbook treatment of topics relevant to national security,
- enlivening the curriculum with ideas and information that will help make economics more interesting and understandable to students.

The most basic concern of government is to provide security and safety for people and their property--security and protection against foreign powers which might invade a country or threaten its vital interests in other ways, and security against internal subversion. One former United States Secretary of Defense defines national security as "The ability to preserve the nation's physical integrity and territory; to maintain its economic relations with the rest of the world on reasonable terms; to protect its nature, institutions, and governance from disruption from outside and to control its borders."

In today's world of nuclear weapons, spy satellites, international terrorists and huge armies, the task of providing for national security and the common defense is critically important. A democracy such as ours needs citizens who have an understanding of the problems of national security and an ability to acquire information, form judgments and make thoughtful decisions about national security policies and issues.

Awareness of the societal need for citizen competence with regard to national security issues has been increasing. For many years national security had been considered the narrow preserve of specialists and policymakers. Knowledge and background in the subject were considered too technical even for the most attentive citizens, let alone average high school students.

This situation has changed. There has been growing recognition among specialists and policymakers that as a democracy the United States cannot successfully plan for its security in today's world without broad citizen support and responsible participation in policy processes by an informed public. This recognition has been paralleled by an increasing awareness among social studies educators that fulfillment of their obligation for citizenship education in our global age requires attention to national security topics. The lessons in this book are designed to help teachers meet this responsibility.

How to Use the Lessons

This book contains 33 **"Lessons."** Each lesson is a complete instructional activity designed to introduce particular content and/or skills. The lessons are not intended to constitute a coherent, separate course or unit of study. Rather, they are intended as a large pool of teaching resources which can be used variously by different teachers to infuse national security topics into their ongoing curriculum. Many teachers will select only a few lessons to supplement given parts of their course. Others may use a large number of lessons.

Different choices about how to use the lessons are possible because each lesson is designed to be used singly, without reference to any other lesson in this volume. Nearly every lesson can be completed in one to three class meetings. A very few lessons might take a little longer to complete.

Fit With Curriculum

The lessons are designed to help teachers deal more effectively with topics relevant to national security that are rooted in economics. They do not call upon you, the teacher, to depart significantly from your course objectives and content. Rather, lessons are organized and presented to help you link them to the content of commonly used textbooks.

The lessons are grouped in 6 **"Sections"** corresponding to major divisions of subject-matter in a high school economics course. Section I contains eight lessons dealing with fundamental economic concepts. Section II has five lessons on topics illustrating microeconomic concepts related to markets, supply, and demand. Section III contains six lessons on microeconomic concepts related to market structure and market failures. Section IV presents six lessons on various macroeconomic concepts. Section V includes five lessons dealing with international economic concepts. Section VI contains four lessons relevant to economic decision-making and measurement concepts. Each section contains an **"Overview for Teachers"**, a brief essay on the national security dimensions of the economics topics covered by the section.

Format of the Lessons

Each lesson begins with a **"Lesson Plan and Notes for Teachers."** This material includes a description of the main points or themes of the lesson, the economic concepts taught in the lesson, the instructional objectives, and suggested procedures for teaching the lesson. In addition, there are suggestions about connections of each lesson to the content of high school economics textbooks. These suggestions can provide guidance about how each lesson can be used to supplement the content of standard textbooks.

The teacher material is followed by one or more **Handouts** for students that can be readily duplicated for student use. It is expected that teachers will duplicate and distribute copies of the student materials to each student. The student materials always contain exercises and application activities. Application exercises require students to use information and ideas presented in the Handouts in order to indicate achievement of lesson objectives.

A particular lesson may have some exercises that are quite challenging and complex. Some teachers may wish to have all of their students complete all the application exercises at the end of a lesson. However, other teachers may not want to spend that much time on a given lesson; so they will use the application activities selectively. Another alternative is to assign easier or simpler exercises to the entire class and to assign more challenging or complex activities only to more capable students. Thus, the more challenging activities would serve to enrich and extend the learning experiences of the advanced students.

Steps in Teaching

Little time is needed to prepare to use a lesson. To teach a lesson, follow these steps.

- o Read the **Handouts** for students and the **Lesson Plan and Notes for Teachers**.
- o Make and distribute copies of the student materials.
- o Follow the teaching suggestions for opening, developing, and concluding the lesson.

The lesson plans are presented as suggestions, not as prescriptions. The materials are organized so that you can easily modify or adapt the lessons and lesson plans to make them more useful in a particular situation. Furthermore, you may want to alter lesson plans so that they conform to instructional procedures or strategies with which you are more comfortable or are able to use more effectively with your students.

Main Features of the Lessons

The lessons in this book were developed to meet a set of criteria about instructional design. These criteria describe the distinctive features of the lessons and our approach to developing them. The statements below summarize these criteria.

1. Each lesson deals with content that complements and fits with secondary school courses in economics. The use of these lessons can be justified in terms of standard curriculum goals and objectives because the lessons connect directly to major topics in the secondary social studies curriculum.

2. Each lesson complements but does not duplicate textbook treatments of economics. The lessons have been designed to extend and enrich the subject matter found in widely used textbooks through in-depth study, the use of data, and other strategies.

3. The content of each lesson is accurate. National security scholars have reviewed each lesson for content validity. Every effort has been made to present factually accurate information on national security concepts and relevant economic topics.

4. Each lesson presents national security in a balanced way that does not advocate a particular point of view. The lessons apply concepts and ideas from the academic field of national security studies to the purposes of citizenship education. They do not try to advance explicitly or implicitly one point of view regarding national security topics as superior to all others. Rather, they seek to advance students' knowledge of the national security dimension of economics as well as their intellectual skills in preparation for responsible citizenship.

5. Each lesson should enhance student understanding of some aspect of national security. National security is a fundamental concern of any nation. The lessons have been designed to introduce to the curriculum national security topics such as international conflict and cooperation, arms competition and control, military strategy, policy-making for national defense, the relations of the military to society, citizen's responsibilities to their nation, and the like.

6. Each lesson includes a clear statement of purposes and well-organized content related directly to those purposes. Effective instructional materials help teachers and learners know what they are expected to do by clearly stating the purposes or objectives of teaching and learning. Further, such materials structure content logically in terms of the objectives to be achieved.

7. Each lesson encourages active learning by requiring the students to apply knowledge gained to the completion of various cognitive tasks. Active learning is the meaningful use of knowledge. It involves organization and interpretation of information, the construction of valid generalizations, and appraisal of ideas. To demonstrate achievement, students must be able to apply or use facts, ideas, or skills as indicated by lesson objectives. Each lesson contains some type of application exercise, which is connected to the purpose(s) of the lesson.

8. Each lesson presents content and learning activities in ways readily usable by high school students. Social studies teachers and curriculum supervisors have reviewed the lessons for instructional validity; how well the lessons actually work in the classroom. Every effort has been made to prepare lessons that are practical and usable in typical high school classroom situations.

Other Books in the NSNA Series

This book of lessons is one of five in a series prepared by the National Security in the Nuclear Age Project (NSNA), an activity of the Mershon Center's Citizenship Development for a Global Age Program. Each of the other four books contains lessons designed to supplement a specific social studies course. The other books of lessons are:

- o American Government and National Security
- o American History and National Security
- o World History and National Security
- o World Geography and National Security

Many of the lessons in each of these books would be relevant to courses in economics. In addition, the project has prepared a sixth book, Essentials of National Security: A Conceptual Guidebook for Teachers. This book consists of ten chapters written expressly for teachers by leading national security scholars. Each chapter presents basic concepts of this academic field related to a particular topic such as arms control. Taken together, the ten chapters provide teachers with a conceptual map of national security subjects and a guide to additional sources of information.

A Brief List of Recommended Books for Teachers

Allison, Graham T., Carnesale, Albert, and Nye, Joseph S., Jr., eds. Hawks, Doves, and Owls: An Agenda for Avoiding Nuclear War. New York: W.W. Norton, 1986.

This edited volume addresses important questions, including how nuclear war might occur, what the dangers are, and how they can be reduced.

Berkowitz, Bruce D. American Security: Dilemmas for a Modern Democracy. New Haven, Connecticut: Yale University Press, 1986. Berkowitz discusses the significant limits placed on democratic societies in achieving national security, including a number of important issues including NATO, the realities of U.S. politics, and intelligence errors.

Blacker, Coit D. and Dufey, Gloria, eds. International Arms Control: Issues and Agreements, 2nd ed. Stanford, California: Stanford University Press, 1984. This is a description and an insightful history of arms control. Especially helpful is its extensive appendix that includes the actual texts of many agreements.

Chaliand, Gerard, and Rageau, Jean-Pierre. A Strategic Atlas: Comparative Geopolitics of the World's Powers, 2nd ed. New York: Harper & Row, 1983. This striking multicolored atlas begins with a quote from Napoleon, "The policy of a state lies in its geography." That sentiment sums up Chaliand and Rageau's volume. The main portion is dedicated to geographical factors relating to the "Security Perception of the U.S., USSR, and Regional and Middle Powers." Also included are sections on historical context of the contemporary world, economic data, and the military balance. An excellent resource for both classroom and teachers preparation.

Harf, James E., Kincade, William H., and Trout, B. Thomas, eds. Essentials of National Security: A Conceptual Guide for Teachers. Columbus, Ohio: Mershon Center, forthcoming. This is part of the National Security in the Nuclear Age Series. Written specifically for high school teachers by national security specialists, its ten chapters form a balanced perspective on the basic topics of national security. These include the premises of national security, conflict in the modern era, conflict management, strategy, arms control, policy-making, economics, the military and society and morality and national security.

Jordan, Amos A., and Taylor, William J., Jr. American National Security: Policy and Process, Revised ed. Johns Hopkins University Press, 1984. One of the most comprehensive yet readable volumes on the entire U.S. national security policy making process. The first section deals with the evolution of U.S. security policy. There are also chapters on various actors in the policy making process--Congress, the Executive, the military, issues, and regions.

Kruzel, Joseph, ed. American Defense Annual: 1986-1987. Lexington, Massachusetts: Lexington Books, 1986. This annual publication summarizes the present state of national security studies. It includes chapters on the defense budget, arms control, U.S. defense strategy and other timely topics. Many of the issues are presented with more than one competing viewpoint.

Mandelbaum, Michael. The Nuclear Question: The United States and Nuclear Weapons, 1946-1976. Cambridge: Cambridge University Press, 1979. Mandelbaum writes about the history of nuclear weapons and the political issues relating to them with specific reference to U.S. policy. This is an excellent and reasonably brief overview that is useful for the advanced as well as the general reader.

Mandelbaum, Michael. The Nuclear Revolution: International Politics Before and After Hiroshima. Cambridge: Cambridge University Press, 1981. Mandelbaum concisely overviews how nuclear weapons have reshaped the foreign policy of nations by comparing the nuclear age with other periods of history since the fifth century B.C. An excellent resource for comparing such issues as the British-German rivalry before World War I and modern tariff controversies with U.S.-Soviet relations.

Olvey, Lee D., Golden, James R., and Kelly, Robert C. The Economics of National Security. Wayne, New Jersey: Avery Publishing Group, 1984. A thorough and detailed examination of the many issues related to economics and national security. It attempts to make economic techniques accessible to the general reader. Each section presents the relevant economic theory before addressing the related national security issues. Chapters are included on the federal budget, the impact of defense spending, concepts of efficiency, and cost benefit analysis.

Rovner, Mark. Defense Dollars and Sense: A Common Cause Guide to the Defense Budget Process. Washington, D.C.:Common Cause, 1983. Concisely, and with the use of numerous charts and graphics, Rovner describes the entire defense budget making process. Not only does he explain components of the budget, but details all the decision points in the Executive and Congressional branches, touching on such issues as lobbying, oversight, Congressional committees, and the Department of Defense. An excellent resource for teaching the budget making process in American Government courses, and for understanding many economic and political issues in economics courses.

Russett, Bruce. The Prisoners of Insecurity: Nuclear Deterrence, the Arms Race, and Arms Control. San Francisco: W. H. Freeman and Company, 1983. A clear and concise overview of basic issues relating to nuclear weapons and strategy. Russett does a commendable job of demystifying these issues by clarifying the most relevant issues, the political, while also providing the essential technical information in an understandable manner.

Sivard, Ruth Leger. World Military and Social Expenditures. Washington, D.C.: World Priorities, annual. This yearly compilation of charts, graphics and statistics presents in an arresting manner a wide variety of national security issues. Each year the focus is slightly different. For example the 1985 edition contains graphics on wars and war related deaths in the twentieth century, a map locating nuclear weapons and nuclear power plants in the world, and military control and repression in the third world.

Snow, Donald M. National Security: Enduring Problems of U.S. Defense Policy. New York: St. Martin's Press, 1987. Snow's first four chapters are particularly helpful. There he discusses national security as a concept and the U.S. historical experience. Each chapter concludes with an extensive listing of additional resources.

Trout, B. Thomas, and Harf, James E., eds. National Security Affairs: Theoretical Perspectives and Contemporary Issues. New Brunswick, New Jersey: Transaction Books, 1982. A reader with chapters by national security specialists touching on the essential issues of national security with an emphasis on teaching. The introduction is entitled "Teaching National Security" and each of the chapters has been written with the teacher in mind. Topics include U.S. and Soviet strategic thought, the military budget process, arms trade, NATO, and others.

United States Arms Control and Disarmament Agency. World Military Expenditures and Arms Transfers. Washington, D.C.: ACDA. Annual. Not only does this reference work include extensive data on arm transfers but each year's issue summarizes a variety of topics relating to military expenditures. There are also included several charts and graphs.

SECTION I
FUNDAMENTAL ECONOMIC CONCEPTS

List of Lessons

This Section has eight lessons which place the economic aspects of national security decision-making into the context of basic economic concerns. The lessons are:

1. "Guns vs. Butter:" Allocating Resources for Defense
2. "Guns vs. Butter:" The Opportunity Costs of Defense Spending
3. How Many Weapons Are Enough? Marginal Analysis
4. Allocating Defense Dollars: Cost Benefit Analysis
5. Military Research and Civilian Technology
6. U.S. and Soviet Economic Strength Compared
7. Incentives and National Security
8. Contracting for New Weapons: Perverse Incentives

Overview for Teachers

In examining basic economic concepts there is perhaps no better set of cases than those provided by national security decisions. Economics deals at all levels with the allocation of scarce resources and the wide array of choices attendant thereto. Decisions must be made as to what is to be gained and what is to be lost and, consequently, what relative values are to be placed on various "goods" that can be attained with the resources at hand.

At the national level such choices affect how a society as a whole will employ its resources and distribute its economic goods. Among the most constant of the broad economic choices that a society must address in today's world are the requirements for defense of the nation. But those requirements are in constant competition with other requirements which also draw upon the nation's resources. The instrument by which such national choices are made and recorded is the national (or Federal) budget. Thus, it has been said with regard to determining national choices that "budget is policy." That means no matter what policy has been declared or is intended by the leadership, the actual policy can only be that which is implemented through budget allocations. National security is a prime example of this reality. Defense policy is expressed in large part through the procurement of goods and services--military manpower and materiel--necessary to meet perceived security requirements. National security choices are therefore fundamentally economic choices.

The broadest, and most common, expression of economic choices relative to security is contained in the phrase, "guns versus butter." **Lesson 1** presents this classic choice between expending scarce national resources for defense ("guns") or general welfare ("butter"). As shown, in the United States this choice is basic to the purposes of our federal government. The Preamble to our Constitution charges the government to "Provide for the Common Defense and Promote the General Welfare."

As **Lesson 2** demonstrates, however, this choice, like all economic choices, is a complex one. For every unit of economic value expended to meet a perceived defense requirement, a similar unit is unavailable for use to meet a perceived domestic need. In using resources to achieve the first requirement, an opportunity to use those resources for the second purpose (or any other purpose) is lost. Hence, "guns versus butter" is also an expression of the basic economic concept of the "opportunity costs" imposed by scarce resources subject to competing demands.

In the face of those demands, one of the most difficult parts of determining the best outcome is then to be able to place some relative value (or "utility") on the societal return for choosing to allocate resources to "guns" rather than "butter." The social value of defense as an economic "good" serving the public is difficult to determine especially in conditions of prevailing peace (i.e., the absence of war). Because they represent an economic choice, defense requirements must always respond to the question: "how much is enough?" Less than enough could place a nation in jeopardy; more than enough could provide additional defense but only at an increased cost in terms of other needed programs. **Lesson 3** addresses this question as a problem illustrating the concept of "marginal utility," determining the relative value of added defense against the cost of resources lost to the general welfare. **Lesson 4** looks at the same basic issue, but explores it in terms of the choice between different ways to expend resources in order to optimize national security benefits: How can defense dollars be most effectively utilized?

Another aspect of the effective use of resources is treated in **Lesson 5**. This Lesson introduces broader issues of economic growth and the interrelationship of the military and civilian sectors of the economy. Overall economic growth can be advanced or retarded by the allocation of resources in one or another of these sectors especially when technological advancement is diffused throughout the economy. The military sector has traditionally been an area of high technological development. For example, whether intended or unintended, military technology can often provide broader benefits to the economy through applications in the civilian sector. By the same token, the dedication of scientific resources to defense may create hidden opportunity costs by precluding whatever use those resources might have been put to in pursuit of non-military projects.

Of course, security requirements do not exist in the abstract. The premises underlying national security impel nations to measure their own capability, however imprecisely and uncertainly, against the capabilities of perceived adversaries. Insofar as national security is determined and expressed in economic terms, therefore, comparative data must be taken into account. Since overall national security is an extension of economic strength, the calculation of national security is in fact relative, not absolute. **Lesson 6** introduces this point by examining the relative economic strengths of the United States and the Soviet Union. In contrast to more common approaches, the measures presented in this lesson focus on the broad economic foundations of the two societies rather than on those factors that apply only to the military balance or the respective nuclear arsenals.

In every economy, there are prevailing incentives that provide the driving force for economic actors. In some non-market, "command" economies such as the Soviet Union this driving force may emanate from a centralized decision-making framework. In market-type economies like the United States, however, these incentives arise within the interaction of demand and supply, determining prices and profits in the marketplace. **Lesson 7** looks at this system as it affects national security decision-making. If "budget is policy" in the economics of national security, then the incentives which emerge from the budget process may work against the economic ends that the budget intended to achieve. **Lesson 8** explores the consequences of reliance on the working of the marketplace by looking at the system of defense contracts through which military requirements are provided by industry in the civilian sector. The resulting economic interaction from defense contracts can result in incentives--termed "perverse incentives"--that may drive the system toward less rather than more effective use of resources.

"Guns Versus Butter": Allocating Federal Resources for Defense

by Terry L. Smart

Preview of Main Points

This lesson presents the conflict between scarce federal funds and competing demands for those funds by focusing on the need for adequate national defense and the government's responsibility to promote the general welfare. Students are introduced to the "guns versus butter" choice and examples of government spending for both.

Connection to Textbooks

This lesson can be used with textbook treatments of the budgeting process under federal fiscal policy, the federal deficit, or trade-offs among goals.

Economic Concepts

Security, trade-offs, deficit, and fiscal policy.

Objectives

Students are expected to:

1. understand that the expression "guns versus butter" refers to the allocation of federal funds between defense and general welfare; and
2. identify examples of spending on "guns" and "butter."

Suggestions for Teaching the Lesson

Opening the Lesson

- Review the concept of economic scarcity with the class. Explain to students that this concept can be applied to government. You might ask what scarce resources government possesses. Responses may include things other than taxes. Then explain that in this lesson students will focus on the scarcity of federal revenues from taxes and borrowed money.
- Distribute the Handout. Have students complete the reading assignment.

Developing the Lesson

- After the reading assignment, have students answer the first set of six questions in the Handout. These are fact/recall questions that cover main points in the reading. You may wish to have students share answers with the class or work in groups and have the groups report their answers.
- Ask the students to offer reasons why defense and welfare spending are referred to as "guns" and "butter." Discuss the students' answers to the questions to determine if the students have understood the following concepts: (1) scarcity, (2) budget-making, (3) allocation, (4) the common defense, and (5) general welfare. Make certain these concepts are understood before the class takes up the "Apply Your Knowledge" section in the Handout.
- After students complete questions 7-13 in the "Apply Your Knowledge" section in the Handout, discuss their responses. Ask the students to explain the reasons for their answers. Some of the questions may have more than one correct answer.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Concluding the Lesson

- Ask the students to offer their own examples of "guns" and "butter" issues. Write these on a chalkboard and ask the class to classify them as A, B or C (as in the "Apply Your Knowledge" section).
- Ask the students to consider the decision-making problem before legislators who face trade-offs between defense and general welfare allocations. You might ask how they would make such decisions and why.

Answers to the Handout

1. Unlimited wants cannot be satisfied by limited resources creating the problem of scarcity.
2. Taxes and borrowing.
3. Through decisions on outlays and taxes by Congress in the budget process.
4. Establish justice, insure domestic tranquility, provide for the common defense, promote the general welfare, and secure the blessings of liberty.
5. Enlarged.
6. Grown larger.
7. Either A or C; subject to debate.
8. A
9. B or C; subject to debate.
10. B
11. B or C; subject to debate.
12. A
13. B or C; subject to debate.

"Guns Versus Butter": Allocating Federal Resources for Defense

Scarcity is the basic economic problem facing all societies. Wants are unlimited but the resources required to fulfill wants are limited. Individuals face the problem of scarcity. So do governments, including the United States.

The United States government can purchase resources with its income, mostly from taxes. It also can borrow money and recently has done so heavily each year. These government revenues are allocated to meet the needs of the country and the demands for services placed on the government by its citizens.

How does the U.S. go about making decisions about the use of its resources? Budget-making is the process by which these decisions are made.

The United States Constitution reserves to the Congress the right and responsibility to determine how government resources are allocated. By custom, the President proposes to the Congress an annual budget which recommends expenditures referred to as outlays. Congress then responds to the President's budget by authorizing expenditures. During the process, the President's budget is usually changed a great deal.

The preamble to the Constitution charges the federal government with the following responsibilities: establish justice, insure domestic tranquility, provide for the common defense, promote the general welfare and secure the blessings of liberty for its citizens. The government must spend money to fulfill these responsibilities. This requires the government to decide how to allocate funds to fulfill competing demands for federal monies.

Our nation's priorities are somewhat reflected in how funds are allocated among competing demands. In general there are two broad categories of priorities: (1) providing for the common defense, and (2) promoting the general welfare. These two broad categories often are referred to simply as "guns" and "butter." Many people assume that increased spending in one of these two categories comes at the expense of spending in the other category because federal government does not have the funds to completely satisfy demands for both defense and general welfare.

Since World War II the concepts of defense and general welfare have undergone dramatic change. As a result, the obligations of the federal government have increased. For example, consider the impact of the nuclear age on government's need to provide for the common defense. Or consider the commitment of the U.S. to defend our allies and our own national security interests world-wide.

Since World War II the federal government's role in promoting the general welfare has also been dramatically enlarged. Many Americans have come to expect a greater role for the federal government in providing educational opportunities; providing benefits for the young, the old, and the poor; and providing comprehensive medical care, jobs, and public works. These social needs compete with defense needs at a time when a growing federal deficit seems more and more unacceptable to the American people.

Check Your Understanding

1. What do resources and wants have to do with the economic problem of scarcity?

2. List the two major sources of funds for the federal government.

From *Economics and National Security*. Mershon Center, The Ohio State University.

3. How are allocation decisions made by the federal government?

4. List three constitutional responsibilities of the federal government.

5. Has the federal government's role in providing for the common defense enlarged or decreased since World War II?

6. Has public demand for federal welfare services grown larger or smaller since World War II?

Apply Your Knowledge

Seven examples of federal allocation decisions are given below. Select the description that best matches and place an A, B, or C in the blank next to each example. Be prepared to give reasons for your choices.

A. Illustration of the federal government's responsibility to provide for the common defense

B. Illustration of the federal government's responsibility to promote the common welfare

C. Neither A nor B

7. __ Congress passed a bill authorizing $27 million in "humanitarian assistance" for rebels in Nicaragua fighting against the pro-Marxist regime in power there.

8. __ Congress spent $4.2 billion to purchase 618 Sergeant York laser-and-radar guided air-defense guns for army tanks.

9. __ Congress approved an appropriation of $500 million for a Department of Energy program of research to develop new synthetic fuels.

10. __ The Reagan Administration requested Congress to provide $126 million for research into the causes of a disease known as AIDS.

11. __ Members of Congress proposed a constitutional amendment requiring the federal government to operate with a balanced budget.

12. __ The Reagan Administration planned a summit meeting between the President and the head of the USSR.

13. __ Congress passed the Fair Credit Billing Act in 1975 to help consumers resolve disputes with creditors.

"Guns Versus Butter:" The Opportunity Costs of Defense Spending

by Steven L. Miller

Preview of Main Points

National security requires both the arms necessary to defend a country from danger from without and the production of goods and services to make the nation secure from within. The purpose of this lesson is to apply the concept of opportunity cost to the fundamental choice between guns and butter thereby reinforcing the idea that choices are necessary when productive resources are scarce.

Connection to Textbooks

This lesson can be used in conjunction with most standard economics textbook treatments of opportunity cost, the production possibilities frontier (in some texts), or the economic functions of government.

Economic Concepts

Opportunity cost, scarcity, trade-offs, and economic institutions (government).

Objectives

Students are expected to:

1. define ***opportunity cost*** precisely;

2. give examples of ***opportunity cost*** in terms of foregone alternative consumption, purchases of other defense materials, or other government spending; and

3. graph a production possibility frontier to relate the problem of scarcity to the need for making choices.

Suggestions for Teaching the Lesson

Opening the Lesson

- Inform the students of the objectives of the lesson.

- Explain that the term ***opportunity cost*** comes from the idea that any use of resources to produce one thing means that there is an important, but often hidden **cost**: the **opportunity** to use those resources in the next most valuable way. For the individual, each person is the ultimate arbiter of what is most valuable to him or her. Societies often use voting or some other political process to determine the "best" use of resources.

- Ask the students for some opportunity cost examples, e.g., time spent watching TV costs the use of that time for listening to records or doing homework. Help students to see that the opportunity cost of watching TV is the best foregone alternative, such as listening to records, not the sum of the lost opportunities.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Developing the Lesson

- Distribute copies of Handouts 1 and 2 to the class. Be certain that the students understand the directions in the student materials.

- Divide the class into small groups of about four students each. Have the students read Handout 1 and complete the questions at the end working in groups of four.

- Check the students' answers to Handout 1. Have the students work in groups to complete Handout 2.

Concluding the Lesson

- Ask each student to write a definition of *opportunity cost* and provide an example.

- Discuss the following questions:

  1. Is there always an opportunity cost to the use of resources to provide national security?

  2. Since money is not a resource of production, why will spending for weapons decrease production of something else?

  3. How can we tell if the opportunity cost of something is too much?

Suggestions for Additional Reading

Brady, Linda P. "The Economics of National Security." Essentials of National Security: A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

See Brady for more background information. Early portions of the chapter discuss the guns vs. butter problem and there is a section that provides material on the budget process that could be helpful in conjunction with the Handout 1 of the student material.

Trout, B. Thomas. "The Premises of National Security." Essentials of National Security: A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

Trout's chapter provides more information on the selection of weapons systems as related to a nation's national security objectives.

Answers to Handout 1

1. Answers will vary. An example is retaining the dams and giving up the B-13.

2. Answers will vary. The opportunity cost of the cruisers might be either the missiles or the bombers.

3. Answers will vary. Generally, private spending will be curtailed, e.g., spending on clothing or recreation or medical care will be given up.

Answers to Handout 2

4. 23; 15.
5. 6 units of weapons; 12 units of food; 7 units of food.
6. 3 units of food; 4 units of food.
7. Not enough productive resources.

"Guns Versus Butter:" The Opportunity Costs of Defense Spending

In a world where productive resources--land, labor, and capital goods--are scarce, the use of those resources to produce one thing means that they cannot be used to produce anything else. Land used to house a military base cannot be used for a park or a housing development. Mechanics that fix airplanes for an airline are not available to maintain planes for the military. Thus, nothing is really "free" if it is produced with scarce resources that have alternative uses. This basic economic principle is summarized by the acronym "TINSTAAFL"--There Is No Such Thing As A Free Lunch!

Economists use the term **opportunity cost** to describe the best of the alternative uses that were not chosen. For example, you might use an hour of your time watching TV instead of listening to records or doing homework or talking to friends on the telephone. There are hundreds of ways in which you might employ the resource of one hour of your time. The **best one** of these alternatives that you did not choose is your opportunity cost of watching TV.

Opportunity cost is a powerful idea in helping clarify choices that must be made. One area where the idea of opportunity cost is applied quite often is in deciding how much money the federal government should spend for defense. There are several common arguments that one generally hears that are based on the idea of opportunity cost.

In this Handout you will identify the opportunity cost argument in several statements and then provide some examples of your own. In Handout 2 you will develop a graph that depicts opportunity cost.

Opportunity Cost Arguments

Imagine that you are watching the evening news during which the reporter who covers Congress gives the report below. Underline the examples of opportunity cost that are mentioned and then answer the opportunity cost questions that follow.

"The choices the Congress faces are difficult. To reduce the deficit in the federal budget by the amount agreed upon will require either a politically unpopular tax increase or cuts in spending. The committee has already decided that a tax increase is out. So a decision will have to be made about what government program to give up. The committee has narrowed the choices down to four programs. At least two of these will have to be eliminated if taxes are to remain the same. Look at the chart on the screen and keep in mind that all four programs could cost about the same."

Alternatives

B-13 bomber
"Intimidator" Missile System
"Redoubtable" class cruisers
Western states dam projects

"The advocates of each of the programs have turned out in force. Here is a videotape of one conversation we heard earlier today. I am sure you will recognize each of the individuals."

General Hire Flyer: If we go ahead with the production of the new "Intimidator" missile system as you have proposed, Senator, I am sure that the Congress will not also provide the new B-13 bombers that we have requested. I believe that giving up the bombers is too high a price to pay.

Senator Bluff: I have suggested that we need both, General. Congress might fund both if funds can be found elsewhere in the budget. Why not eliminate several of the "Redoubtable" class cruisers proposed by the Navy. They are somewhat less important for national security at present.

Admiral Salt: Senator, you must be joking. Adequate ability to project our naval power where it is needed is no laughing matter. I suggest we can ill afford the reduction in our planned shipbuilding program. We should look outside the military budget for the funds and cut the planned dam construction projects, painful as that might be.

Congressman Dry: My constituents are counting on the water that the dams will make available. I suggest that the proposed military budget is more than adequate for our national security needs. I believe that the water projects must be funded even if that requires some sacrifice in the weapons budget. We do not need both the B-13 and the "Intimidator." I believe the missile system must be given up.

Opportunity Cost Questions

1. Give one example of opportunity cost that illustrates giving up one defense weapons system in favor of retaining another type of government program.

2. Give two examples of opportunity cost that illustrate giving up one weapons system in favor of retaining another.

3. What are some possible opportunity costs from a decision to raise taxes and fund all of the programs mentioned above?

Production Possibilities

It should be clear by now that resources used for weapons cannot be used for other purposes and vice versa. One way to express both the idea that scarce resources mean limited output and the notion of opportunity cost is through a graph called a production possibilities frontier. To make the idea easier to grasp, assume that a society has a choice to produce weapons or food or some combination of the two. In the space provided, graph the quantities of weapons that could be produced given the corresponding production of food. For example, the table below shows that 15 units of weapons is the maximum amount that can be produced even if all the society's resources are used to produce weapons and none is used to produce food (food = 0 on the table). On the graph this point, weapons = 15 and food = 0, is already graphed for you as an example. In this example the opportunity cost of producing 15 units of weapons would be 23 units of food.

Using the information in Table 1, fill in the remainder of the graph and answer the questions that follow.

Graph

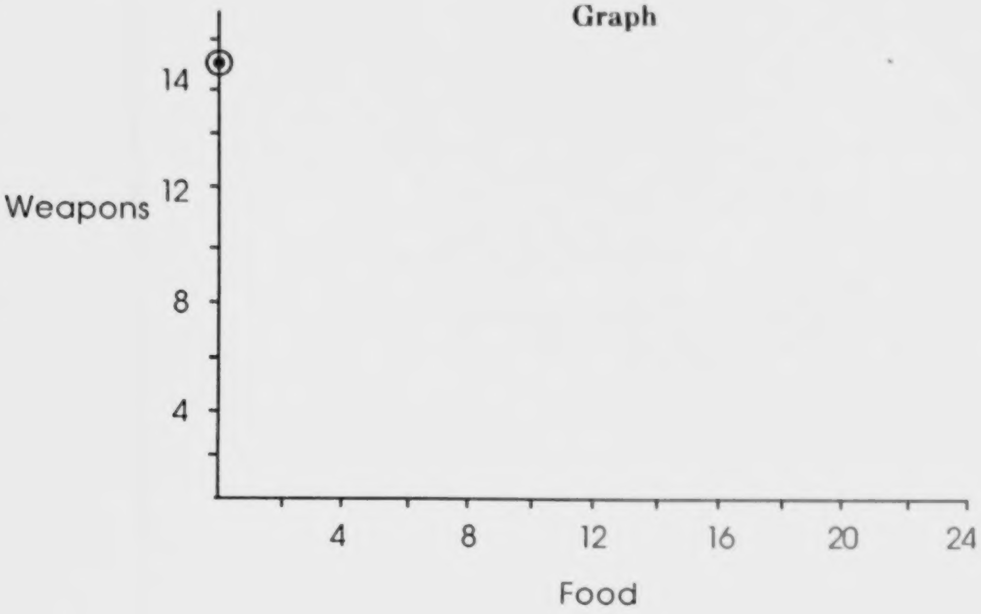

Table 1

Weapons	Food
15	0
12	6
9	11
6	16
3	20
0	23

From *Economics and National Security*. Mershon Center, The Ohio State University.

4. What is the maximum number of units of food that the society can produce? ___________ The maximum amount of weapons? ___________

5. What is the opportunity cost of producing 11 units of food? ___________ Of 9 units of weapons? ___________ Of 6 units of weapons? ___________

6. Assume that the society had been producing 3 units of weapons and 20 units of food. What is the opportunity cost of the weapons? ___________ Now assume that due to an external threat the society decides to produce 3 more units of weapons this year compared to last year. What is the opportunity cost of the additional 3 units of weapons? ___________

7. Why can't the society produce a combination of weapons and food **outside** or beyond the line of the graph, for example, 20 units of weapons and 25 units of food?

How Many Weapons Are Enough? Marginal Analysis

by Steven L. Miller

Preview of Main Points

Like most economic concepts, marginalism has applications beyond the problems normally associated with economics. The purpose of this lesson is to show how marginal analysis might be applied in a national security context.

Connection to Textbooks

This lesson can be used in conjunction with the section of the textbook that presents the concept of marginalism. If the textbook does not use this term specifically, the lesson could fit into the section that examines diminishing returns, a closely related idea.

Economic Concepts

Marginalism and diminishing returns.

Objectives

Students are expected to:

1. use marginal analysis to determine the value of additional arms purchases to national security in a hypothetical case;
2. discuss the type of data needed to use marginal analysis for this purpose in real cases; and
3. consider how marginal analysis might be used to determine how many weapons to purchase.

Suggestions for Teaching the Lesson

Opening the Lesson

- Inform the students of the objectives of this lesson.
- If the students have not encountered the term **marginal** in economics before, explain that the first part of the exercise (Handout 1) will provide them with an understanding of the concept that they will then use to solve a problem.
- Distribute Handouts 1 and 2. Be certain that the students understand the directions in Handout 1. They may work individually or in pairs.

Developing the Lesson

- Work with the students to complete Handout 1. This handout serves as an introduction to the concept of marginalism.
- You might want to indicate the points of diminishing marginal utility to the students (2 tapes, 1 book). Ask the students why marginal utility decreases as the number of items increases.
- Have the students apply the concept of marginalism to the problem in Handout 2.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Concluding the Lesson

- Ask the students to consider how experts might get estimates of a factor like "NS Points" and what such a factor might indicate. It is important to stress that different values and assumptions lead to different assessments of the marginal value of additional weapons purchases. As one example of these differing viewpoints, some believe that any additional U.S. weapons will result in more Soviet weapons thereby furthering the arms race and making both nations less secure. Others believe that some additional weapons will make a "first strike" by the Soviets less likely and thus improve security.
- Discuss what additional information might be needed to determine how many weapons of a certain type to purchase. Cost of the weapons and the cost and value of their alternatives are several of the possible areas to discuss.
- Discuss the reasons why different people might use different data as happened in Handout 2. Explore the difficulties in reaching agreement when there are sharp differences in something like the estimated marginal value of a new weapons system.
- Discuss other factors besides the marginal value of the weapons system that might affect the decision. For example, important political considerations such as the clout of weapons contractors or workers interested in maintaining jobs might affect the decision.

Suggestion for Additional Reading

Mandelbaum, Michael. "Strategy in the Nuclear Age." Essentials of National Security: A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

This chapter provides a clear discussion of how strategy guides weapons development and vice versa. This could be helpful with Handout 2 of the student material.

Answers to Handout 1

1. 4 tapes and 3 books.
2. decreases.
3. Yes. Answers will vary, but students should realize that desires are frequently filled more by the first few of an item consumed, e.g., the first soft drink vs. the tenth. An exception might be the last stamp completing a collection.
4. No. Personal preferences or tastes.

Answers to Handout 2

5. There are already sufficient weapons to more than destroy another country.
6. The marginal value would be very small, if positive.
7. No.
8. Set "A" supports the advocates; set "B" the opponents.
9. Answers will vary. One possibility is that at first, the additional missiles are too few to add as much to deterrent value and that later additions to the number of missiles add comparatively little once adequate deterrent value has been achieved.
10. The last 40 or so missiles add comparatively little to national security--32 NS points.
11. No. Set "B" shows some small and rapidly diminishing value to additional missiles.
12. Answers will vary. One possibility is that the Soviets might feel threatened by the addition of too many more missiles and respond by increasing their own arsenal.
13. Cost of the weapons and alternatives. Also political factors such as interservice rivalries and lobbying by labor and business groups.

How Many Weapons Are Enough? Marginal Analysis

There is often great disagreement on whether too much (or not enough) is being spent on national defense. The debate can be confusing. One economic concept that can be used to help understand the arguments involved is the concept of **marginalism**. From this handout you will learn about the concept of marginalism. In the next handout you will use this concept in interpreting some of the arguments involved with the question "How many weapons are enough?"

In the simplest sense, **marginalism** is a tool for making decisions by thinking about what happens when a bit more or less of something is bought or produced or consumed. For example, when a person decides whether to buy another audio tape or a new paperback book instead, that person usually uses marginal analysis without even realizing it! Let's see how.

Every person has an idea what a particular good or service is "worth" to him or her. Let's suppose we could measure the worth that a person associates with buying tapes or paperbacks to use during a two week trip. We will use a hypothetical unit of measure called "utility" or "utils" for short. The points for the usefulness or utility of the tapes and books might look like this:

Tapes			**Books**		
No. of tapes	**total utils**	**marginal utils**	**No. of books**	**total utils**	**marginal utils**
1	9	9	1	8	8
2	19	10	2	15	7
3	28	9	3	22	__
4	35	7	4	28	__
5	41	6	5	34	__
6	45	4	6	39	__
7	47	2	7	43	__

The second and fifth columns, labeled "total utils," are the total utility points of satisfaction for each item given the number purchased. For example, four tapes yields 35 utils; four books, 28. Notice that the columns marked "marginal utils" show the additional utility added by the purchase of the last item. For example, the first tape purchased gave our hypothetical consumer nine units of utility. The second one added ten more units of utility for a total of nineteen. The third added nine to give a total of 28 and so on.

You should be able to complete the blank spaces in the last column. Do so now and then answer the following questions:

1. Assuming that the price of the tapes and books were the same, how many of each should the hypothetical consumer purchase if he has only enough money to buy a total of seven items?

   HINT: How many utils is the last tape worth? How many is the first book worth? What combination of books and tapes yields the greatest total utility?

2. In general, as the quantity of the item increases, the marginal utility (increases/ decreases).

3. Do you think this pattern holds for most products? Why or why not?

4. Will the "utils" rating on a product or service always be the same for everybody? Why or why not?

From *Economics and National Security*. Mershon Center, The Ohio State University.

Applying Marginalism

Now that you have learned about marginalism, see if you can apply this concept to the ideas presented below. The following paragraphs are similar to what is often written in news magazines about the issue of how much to spend on national defense. Read these "news stories" and then answer the questions that follow.

> Spending on the new missile system is part of the defense buildup that advocates say is necessary to provide for national security. They point to the large increase in Soviet nuclear striking capability as evidence of the importance of the continued efforts to modernize American forces.
>
> Opponents of the missile argue that the weapon is not necessary. They contend that the U.S. already has enough nuclear weapons "to make the rubble bounce." They believe that additional spending on arms is a waste in that it will add little if anything to national security.

5. What does the phrase "make the rubble bounce" mean?

6. Does this phrase suggest anything about the marginal value of additional weapons purchases?

7. Would the advocates of the purchase of the missiles agree with this assessment of the marginal value of the new missiles?

Suppose we could express the national security value of additional weapons spending in much the same way that we expressed the value of consumer purchases in "utils." Let's call this new measure "NS points" for national security points. Examine the table of NS points below. Notice that for each block of ten missiles there are two columns for Total NS Pts and two for Marg NS Pts (marked "A" and "B").

	A		B	
Missiles	**Total NS Pts**	**Marg NS Pts**	**Total NS Pts**	**Marg NS Pts**
10	350	20	340	10
20	375	25	348	8
30	410	35	354	6
40	440	30	358	4
50	465	25	360	2
60	485	20	361	1
70	500	15	361	0
80	510	10	361	0
90	515	5	359	-2
100	517	2	354	-5

8. One set of total NS points and marginal NS points generally provides support to the advocates of the missile system. The other set could best be used to argue the case of the opponents. Which set is which?

   HINT: Remember that the opponents contend that additional weapons will add "little if anything to national security."

From *Economics and National Security*. Mershon Center, The Ohio State University.

9. Why don't the advocates of the missile system believe that each additional increment of ten missiles will add the same amount to national security?

10. If the proposed increase in the number of missiles were 100, how could the proponents' data be used to support the opponents' position?

11. According to the data set, do the opponents necessarily contend that **any** increase in the number of missiles will add nothing to national security?

12. Why might the data show that increases in weapons might actually begin to reduce security at some point?

13. What factors other than the marginal value of additional weapons might influence the decision about how many, if any, missiles to buy?

From *Economics and National Security*. Mershon Center, The Ohio State University.

Allocating Defense Dollars: Cost-Benefit Analysis

by Steven L. Miller

Preview of Main Points

National security can be enhanced by the prudent use of resources. The purpose of this lesson is to show students how cost-benefit analysis might be used in making choices about how many of which weapons would best improve the capability of military units.

Connection to Textbooks

Most standard economics texts include some discussion of cost-benefit analysis, sometimes in the context of marginal costs and benefits.

Economic Concepts

Marginalism, cost-benefit analysis, and tables.

Objectives

Students are expected to:

1. interpret data in tables;
2. understand the concept of marginalism;
3. use data to solve problems involving the weighing of relative costs and benefits; and
4. discuss examples of the application of cost-benefit analysis to current issues regarding the allocation of the military budget for weapons purchases.

Suggestions for Teaching the Lesson

Opening the Lesson

- Inform the students of the objectives of the lesson.
- Review the concept of marginalism with the students.
- Give some common examples of cost-benefit analysis. Ask the students to provide some examples of their own.

Developing the Lesson

- Read the first paragraph of the Handout aloud. Be certain that the students understand what they are to do.
- If necessary, help the students interpret the data in the table, especially the "marginal effectiveness" columns.
- Have the students complete Part I (they may work individually or in small groups) and compare answers and explanations. Be sure that the students understand the reasons for the correct answer.
- Have the students complete Part II and compare answers.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Concluding the Lesson

- Ask the students to give some examples of similar decisions that are being discussed or have recently been decided. Building the B-1 Bomber vs. renovating the B-52s is one example.
- Discuss what data are needed to do the comparisons in cost-benefit analysis.
- Ask students to hypothesize about other factors that might influence the decisions about how many of which weapons to purchase.

Answers to the Handout

1. The greatest total effectiveness (87) is achieved by equipping each unit with 4 BULLSEYEs and 3 ZEROs. The marginal value of the 4th BULLSEYE is greater than that of the 4th ZERO and the marginal value of the 3rd ZERO is greater than that of the 5th BULLSEYE.
2. The greatest total effectiveness (68) is achieved by equipping each unit with 1 BULLSEYE and 5 ZEROs. The marginal value of the 1st BULLSEYE is greater than that of the 6th and 7th ZEROs and the marginal value of the 4th and 5th ZEROs is greater than that of the 2nd BULLSEYE.

Allocating Defense Dollars: Cost-Benefit Analysis

In this exercise you will play the role of a newly hired weapons analyst in the Department of Defense. Your first assignment is to make a recommendation to the Secretary of Defense concerning how many of two different types of weapons the Secretary should request in the next budget. Remember that the resources to produce weapons are scarce and that you will have to justify your suggestion. It will not be satisfactory simply to say "Let's get as many of both as we can." The Secretary is looking for specific numbers and good reasons to back them up. If you can't do the job, you'll be looking for a new position.

PART I

Your problem is what to recommend to the Secretary of Defense. You need some data. Just in time one of the Secretary's assistants drops off a report with the following information in it:

SECRET

NATIONAL SECURITY FORCE LEVEL EFFECTIVENESS ESTIMATES

Tests comparing the battlefield effectiveness of two new field artillery systems have recently been completed. The "ZERO" and the "BULLSEYE" field artillery were compared on relevant factors such as accuracy, ease of use, rate of fire (how rapidly the weapon can be reloaded and fired), tube life (how long the barrel of the cannon will last under different conditions), and destructive power against a variety of targets.

The tests yielded an overall battle effectiveness rating for different numbers of artillery batteries placed in the field. The rating combines all of the various factors into a single number. For example, "ZERO" had an overall battle effectiveness rating of 44 when 4 batteries were placed in the field.

Notice that the battle effectiveness changes with different numbers of each weapon. Because the weapons have different characteristics and impacts on different targets, a mix might be better than equipping the field units with either one or the other.

The data follows:

ZERO			BULLSEYE		
No. of Batteries	Effectiveness	Marginal Effectiveness	No. of Batteries	Effectiveness	Marginal Effectiveness
1	14	14	1	18	18
2	26	12	2	31	13
3	36	10	3	42	11
4	44	8	4	51	9
5	50	6	5	58	7
6	54	4	6	63	5
7	56	2	7	66	3

1. Assume that the two weapons systems cost the same. Also assume that you can equip field units with up to a total of 7 BULLSEYE or ZERO batteries or some combination of the two. What is your recommendation and why?

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PART II

You completed your first assignment very successfully. Now the Secretary has returned your report with the notation that the assumption in your original report that the price of the weapons would be the same was wrong. In fact the price of the BULLSEYE is going to be twice as high as that of the ZERO. This means that the U.S. Army could purchase **two** ZEROs for every **one** BULLSEYE. It also means that the army can no longer afford a total of 7 batteries per unit if BULLSEYEs are included in the purchase. The following table shows the combinations of the two weapons (in batteries per field unit) that are still affordable:

Zero	Bullseye
7	0
5	1
3	2
1	3

2. What would you recommend and why?

Military Research and Civilian Technology

by Judith V. Reppy

Preview of Main Points

This lesson is about the connection between military research programs and civilian technology. The lesson reviews the concept of economic growth. It describes the possible benefits of new military technology for the civilian economy and the opportunity costs associated with allocating a large share of national scientific resources to military programs.

Connection to Textbooks

Economic growth and technological change are implicit in textbook discussions of business cycles and investment, but they are not given much explicit attention. This lesson affords an opportunity to develop these topics more fully.

Economic Concepts

Economic growth, technological diffusion (often called "spin-off"), and opportunity costs.

Objectives

Students are expected to:

1. identify technological change as a source of economic growth;
2. describe in broad terms the allocation of spending for the U.S. program for research and development; and
3. give some examples of spin-offs from military research programs and of the opportunity costs of those programs.

Suggestions for Teaching the Lesson

Opening the Lesson

- Tell the students that this lesson is about economic growth and the effect of new military technology on the civilian economy. Distribute the Handout. Explain to the students that as you lecture, they are to fill in the questions on their Handouts. Point out that your lecture is divided into three sections corresponding to the sections on the Handout.
- Begin the lecture. After covering the material in Section I, pause to give the students time to complete that portion of their worksheet. Check their answers.
- The first section on economic growth is intended as a brief review of a concept that should be familiar already. If more time is available, you may wish to expand the discussion of the difference between extensive growth, which results from an increase in the supply of factor inputs, and intensive growth, which is the result of technological change. The class can be asked to add their own examples to the list given under question 3 of the Handout.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Developing the Lesson

- Next, move on to Section II. Introduce the connection between research activities, new inventions, and economic growth. Sketch the flow diagram in the lecture notes on the blackboard to illustrate the idea. Stress the main point: that money and resources are allocated to research and development (R & D) in the expectation that there will be a pay-off in new products and economic growth.

- After completing this portion of the lecture, give the students time to complete the questions. Go over Section II of the Handout with the class.

- The pie diagram gives information on the amount spent by the Federal government on R & D for various national objectives. Point out that spending on military-related programs is the largest part of government-funded R & D programs.

- Begin the lecture on Section III which outlines the argument over what effects this spending has for the civilian economy. Define the concepts of spin-off and of opportunity costs for the students. Have them answer the questions in Section III of their Handout. Tell them to refer back to the pie diagram in Section II in answering question 8.

Concluding the Lesson

- Refer again to the flow diagram to review the connection between spending on R & D and economic growth. Add the words "increase in national output" to further explain "increase in GNP."

Lecture Notes for Teachers

Section I. Economic Growth

Economic growth occurs when the total production or output of the economy increases. The increase in output can be the result of increases in the supply of factors of production (extensive growth), as when the labor supply grows through immigration or natural increase, or the capital supply grows through investment in new machinery and factories. Historically, however, a large part of the economic growth in the United States can be attributed to technological change (intensive growth).

New technology leads to:

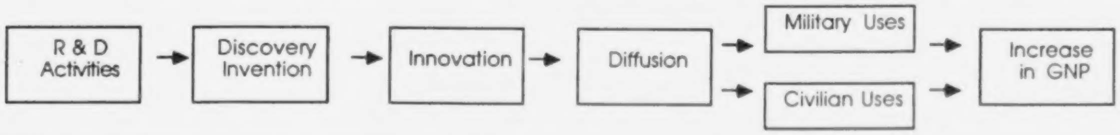
1. New products that are superior to existing products, thereby increasing the value of the gross national product.

2. Newer and cheaper manufacturing processes, which reduce the cost of production so that the same quantity of inputs results in a larger output (increased productivity).

Section II. Research and Development

There are many ways in which new technology comes about: private inventors working on bright ideas; imported technology from other countries; and new discoveries in university laboratories. Probably the most important source in the United States today is the formal programs for research and development (R & D) in large corporations and government laboratories. AT&T Bell Laboratories, for example, has over 12,000 scientists and engineers working on R & D projects, and a budget in 1985 of $2 billion.

The flow chart below illustrates the links between the activities of research scientists and engineers and the process of innovation (introducing a new product or process to the marketplace), diffusion to other users, and the growth of national product.



It should be noted that there is a large element of chance in R & D activities. New discoveries cannot be predicted, nor can the uses of new ideas always be foreseen. Nevertheless, R & D programs are pursued in the expectation that there will be a positive payoff, even if the exact form of that payoff is not known.

A substantial fraction of the R & D in the United States is for military programs. U.S. spending for military R & D has been high ever since World War II which demonstrates how important new technology can be militarily. Currently about 70 percent of federal R & D spending is for military programs. The pie diagram in the Handout shows the relative shares of federal R & D for various national objectives.

Section III. Spin-off and Opportunity Costs

Many inventions can be traced to the program of military R & D. A few are listed in the Handout. Some of these inventions have been important to the civilian economy as well, leading some observers to claim that military R & D is a source of growth for the civilian economy. The most important examples of spin-off in the post-war period are probably in the field of nuclear power, aircraft and computers. Other technologies, such as semiconductors and integrated circuits, have mixed parentage in that they arose in civilian-based programs, but also received support from military programs once they were discovered.

An opposing argument depends on the concept of opportunity costs, or the notion that the resources allocated to military R & D programs could have been used in alternative employments. This argument is a version of the general argument about the opportunity costs of military spending. Since military R & D has absorbed a substantial share of scientific and technical manpower in the United States for over forty years, it is obvious that there must be many other programs that could have been pursued if these resources had been reallocated. The examples of lost opportunities include investment in the development of new technology for railroads, for alternative energy sources, or for waste disposal. Many people who think these are important national goals argue that they have been neglected because of the U.S. emphasis on military R & D.

There is no way of settling this argument once and for all, since there are no comprehensive data on the extent of spin-offs and the economic benefits that they may create. Furthermore, even if some objective measure were available, there would still be a difference of opinion, since the trade-off between different national objectives is at stake in decisions on how to allocate R & D resources.

Suggestions for Additional Reading

Congressional Budget Office. "Defense Spending and the Economy." Washington, D.C., 1983.

DeGrasse, Robert W., Jr. "Chapter III." Military Expansion, Economic Decline. Council on Economic Priorities, N.W., 1983.

Answers to the Handout

Section I

1. An increase in total production (or output) of the economy.

2. Increases in the supply of factors of production (or inputs) and technological change.

3. a, b, d are (a); c, e, f are (b).

Section II

4. a. 70 percent.

   b. Health.

5. New products, specifically new weapons or new ways of manufacturing existing products.

Section III

6. Jet aircraft engines, artificial skin, computers, nuclear reactors, radar.

7. The best alternative that could have been produced with the resources instead (in this case, the other research programs that could have been pursued).

8. Answers will vary.

Military Research and Civilian Technology

Section I. Reviewing Economic Growth

1. Economic growth is defined as:

   ____.

2. Broadly speaking, the main sources of economic growth are

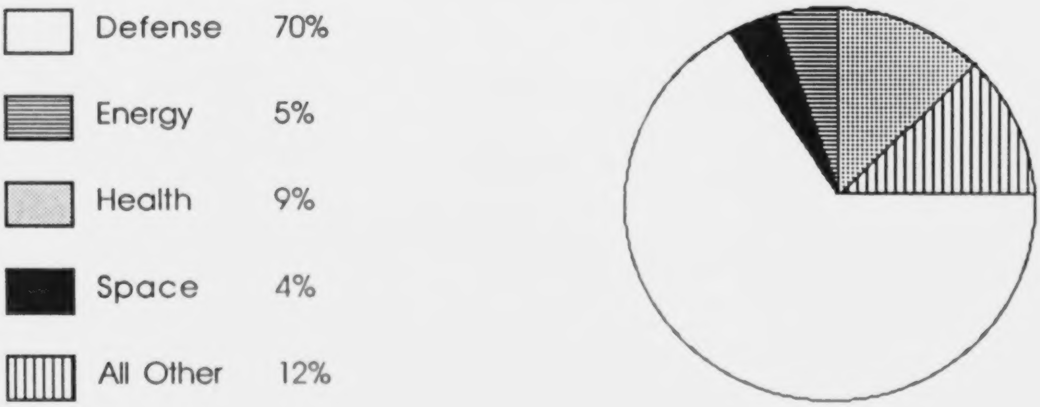
   ____________________ and ____________________.

3. Study the list below. For each item indicate whether it is (a) an increase in factor of production or (b) an example of technological change by placing an a or b on the line next to the item.

   a) ____ Arrival of refugees from Southeast Asia
   b) ____ Construction of a new factory
   c) ____ Invention of radar
   d) ____ Discovery of a new oil field
   e) ____ A cheaper way of drilling for oil
   f) ____ A new hybrid wheat seed

Section II. Facts About U.S. Programs for Research and Development (R & D)

Federal R&D by National Objective, 1984



4. Use the pie diagram to answer the following questions:
   a. What percent of federal R & D is for military R & D? ____________.
   b. What is the next largest program of federal R & D? ________________.
5. What is the expected outcome from this spending on defense research and development?

   ____.

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Section III. Technology Spin-off from the Military to Civilian Sector vs. Opportunity Costs.

6. Below is a list of innovations that were developed originally in military programs. Put a check by the ones with civilian uses.

_ jet aircraft engines

_ nuclear reactors for submarines

_ nuclear bombs

_ artificial skin for burn victims

_ radar

_ laminated armor for tanks

_ computers

_ sonar for detecting submarines

7. The phrase "opportunity costs" means

____

____.

8. What are some examples of the opportunity costs of military R & D programs?

____

____

____.

U.S. and Soviet Economic Strength Compared

by Terry L. Smart

Preview of Main Points

In this lesson students will use economic data to analyze and compare the relative economic strength of the U.S. and Soviet Union. Students will investigate the question: How important to national security are non-military, economic factors?

Connection to Textbooks

This lesson might be introduced in conjunction with the textbook material on factors of production or economic systems.

Economic Concepts

Resources, production, GNP, economic systems, market economy, and command economy.

Objectives

Students are expected to:

1. make hypotheses about the relative economic strength of the United States and the U.S.S.R.;
2. read and interpret a table presenting economic data about the U.S. and U.S.S.R.;
3. use data from the table to evaluate their hypotheses about the U.S. and U.S.S.R.;
4. form generalizations by applying information drawn from the data; and
5. make a judgment about the comparative strength of the two superpowers in the event of war between them.

Suggestions for Teaching the Lesson

Opening the Lesson

o Ask the students to define national security and to list the factors that make a country strong or a world power. If the responses have to do mostly with the military and weapons, ask the students to consider economic factors that contribute to a nation's strength.

o Distribute the student materials. Have the students read Handout 1 and look at Handout 2 to get an idea of what sort of data they will be examining.

o If your students have not been introduced to the terms "market economy" and "command economy," you should explain these concepts. Be certain the class understands the differences before proceeding.

Developing the Lesson

- Ask the students to help you make a list on the chalkboard of the economic factors mentioned in Handout 3. Ask the students to name additional factors and list these.

- Discuss whether economic factors can be critical to national security.

- Have the students work alone to interpret the table in Handout 2 and to answer the questions in Handout 3. Students might share their answers in class discussions or in small groups.

Concluding the Lesson

- Discuss the answers to the "Reading the Table" section of Handout 3. Ask how the U.S. and U.S.S.R. compare on these issues.

- Ask the students to consider factors other than those listed in the table in Handout 2 that contribute to a nation's strength.

- Discuss the students' answers in the "Apply Your Knowledge" section. As the students discuss these questions, you can introduce some new factors with the following questions: Does greater U.S. trade give the United States a potential instrument for spreading its political influence? Which economic system is the better model for other countries concerned about improving their national security through economic strength?

Answers to Handout 3

1. B
2. B
3. B
4. B
5. B
6. A
7. A
8. A
9. A
10. B

U.S. and Soviet Economic Strength Compared

When one thinks of national security in our nuclear age, what often comes to mind are weapons--nuclear weapons and other weapons of war. But are guns, tanks, and bombs the only measure of a country's strength? Are there economic factors which contribute to making a nation powerful? What about land, labor, capital, technology and the standard of living? Does the size of a country's area and population affect its strength? What of its natural resources and industrial and agricultural production? Is its economic system significant in making a nation strong?

Many believe that the United States and the Soviet Union are the world's most powerful countries. But, the two nations are very different. For instance, their economic systems are not alike. The U.S. has a primarily market economy; the Soviet Union, a command economy.

In your opinion which of these two "superpowers" is the more powerful? Why?

Now test your opinion by examining some economic data about the U.S. and the U.S.S.R. given in the table in Handout 2. Then answer the questions on the worksheet in Handout 3. Does the information in the table support your opinion or make you revise your opinion?

Table 1

Economic Data for the U.S. and U.S.S.R.

Land and People	**United States**	**Soviet Union**
Area in Square miles (millions)	3.6	8.6
Population (millions)	230	268.8
Percent of population in urban areas	73	65
Labor force (millions)	82	115
Percent of population in agricultural labor force	3	20
Life expectancy (males, in years)	71	62
Manufacturing labor force (millions)	18.7	29.5
Military personnel per 1000 persons	10	18
Trade (in billions of dollars)		
Imports	129.565	38.516
Exports	114.807	37.166
Production (all units in millions)		
Steel, metric tons	100.8	148
Oil, barrels per day	8.57	12.18
Autos	6.4	1.3
Iron ore, metric tons	80.5	239
Cotton yarn, metric tons	1.1	1.5
Grain, metric tons	238.2	223.4
Meat, metric tons	18	113.4
Value of computers, dollars	58,200	9,200
GNP		
GNP per person in dollars	7,860	3,590
% of GNP spent on defense	7	14
Transportation		
Passenger autos, millions	120	9.2
Rail, passenger kilometers in billions	18.1	331.2
Rail, freight tons-kilometers in billions	1.4	3.507
Air passenger miles in billions	375	160
Other Resources		
Crude oil reserves in billions of barrels	26.5	67
Acres of Arable land per person	2.1	2.1

Sources: Gary E. Clayton and James E. Brown, Economic Principles and Practices, (Columbus, Ohio: Charles E. Merrill, 1983) p. 453; Lawrence Wolken and Janet Glocher, Invitation to Economics, (Glenview, Illinois: Scott Foresman, 1982) p. 388; and Richard Schifter, "U.S.-Soviet Quality of Life: A Comparison," U.S. Department of State, Bureau of Public Affairs, June 1985.

Reading the Table

For each question indicate the U.S. or the U.S.S.R. by placing a letter in each blank.

A. United States
B. Soviet Union

1. __ Which nation has the larger population?

2. __ Which has the larger territory to defend?

3. __ Which has the larger number of farm workers?

4. __ Which has the larger number of the work force in manufacturing?

5. __ Which has the greater number of people serving in the military?

6. __ Both nations have an unfavorable balance of trade. Which is the greater?

7. __ Which nation spends more of its GNP on non-defense goods and services?

8. __ Which nation leads in the production of grain?

9. __ Which nation is the most urbanized?

10. __ Which nation leads in the production of steel and iron ore?

Apply Your Knowledge

11. Based on the information given in this lesson, do you consider the U.S. or U.S.S.R. the stronger industrial power? Why?

12. In which country do you think agriculture to be the stronger? Why?

13. What other information would you need to examine in order to determine which nation was the stronger?

14. At this time, how would you answer the question "Would the United States or the Soviet Union be stronger in the event of a war between them?" Give reasons for your answer.

Incentives and National Security

by Steven L. Miller

Preview of Main Points

Some of the problems in meeting the national security needs of the U.S. are due to the common problem of improperly structured incentives. This lesson challenges the students to apply what they have learned about incentives to some national security problems.

Connection to Textbooks

This lesson could be used after the text discussion of economic incentives.

Economic Concept

Economic incentives.

Objectives

Students are expected to:

1. state how incentives could be the source of the problem in each of the three situations in the student materials;
2. suggest possible remedies for each; and
3. suggest ways in which national security might be imperiled by the failure to remedy the situations.

Suggestions for Teaching the Lesson

Opening the Lesson

- Ask the students if they can think of what incentives they receive to direct their actions in certain ways.
- Ask for examples from school or work where the incentives inadvertently encouraged them to do something that their principal, teachers, or (in the case of their jobs) boss didn't really want them to do.

Developing the Lesson

- Explain that in large organizations incentives that were put into place to get one result sometimes cause other results that were unintended and often bad.
- If possible use any of the examples thought of by the students as illustrations.
- Go over the directions in the Handout with the class. You might want to complete the first situation as a class.

Concluding the Lesson

- Have the students complete the Handout in groups of four or five.
- After the groups are finished, discuss their responses. You should pay particular attention to the connection of the problems identified with the larger issue of national security.

From *Economics and National Security: Supplementary Lessons for High School Courses,* 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Suggestions for Additional Reading

Brady, Linda P. "The Economics of National Security." Essentials of National Security: A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

Gray, Robert C. "Policy Making for National Security: Structure and Process." Essentials of National Security: A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

Hadley, Arthur. "America's Broken War Machine." The New Republic, May 7, 1984, pp. 18-25.

Lynn, William. "Reform Needed So Joint Chiefs Can Act As One." Atlanta Journal and Constitution, March 29, 1985, pp. 11-2F.

Pasztor, Andy. "Criminal Charge Against GTE Recommended." Wall Street Journal, March 22, 1985, p. 5.

Incentives and National Security

Economics has shown that incentives can influence how people behave. For example, your parents might offer you a special reward for getting an "A" in economics. Baseball players often have contracts that specify additional payments for achieving certain goals, such as hitting over .300 or driving in more than 100 runs. Organizations try to structure incentives to encourage people to act in ways that help the organization to achieve its purposes.

However, it is possible for the rewards and punishments to be structured such that people respond in ways that work against the organization's goals. For instance, consider a baseball player who has a clause in his contract that pays an extra $1,000 for each home run he hits after the twentieth one. Perhaps this player, in trying to hit more homers, makes more outs or fails to advance runners on base. The incentive that increases his efforts to hit more homers might actually work against the team's goals of winning games. In this case the incentives have a perverse effect by causing the opposite result from the goals that were intended.

The following paragraphs describe situations that could be due to perverse incentives, that is incentives that work against the goals of the organization. In each case, (1) identify how incentives might be the root of the problem, (2) think of a possible solution, and (3) determine how national security could be affected if the problem is not corrected.

Situation #1: The Revolving Door

Some observers believe that one way defense contractors get their contracts to build weapons systems is to provide lucrative jobs for military officers when they retire. The effect of this could be to encourage officers who have the authority to influence purchase decisions to look favorably on the designs of companies that might hire them upon retirement from the military. Furthermore, former officers can provide useful service to their new employers by using the contacts they made during their careers in the military.

Consider this excerpt from an article by Andy Pasztor in the Wall Street Journal in March, 1985:

> Justice Department investigators have recommended criminal prosecution of GTE Corp. for using a consultant allegedly to obtain military documents the company wasn't authorized to receive . . .
>
> . . . [O]fficials confirmed that GTE is the . . . target of a . . . federal grand jury investigation of alleged document swapping . . . involving Pentagon officials and Bernie Zettl, a former consultant to the [company].
>
> . . . The investigation has focused on charges that Mr. Zettl, a retired Air Force major with extensive contacts among military and civilian decision makers in the electronic warfare business, violated national security laws and regulations.
>
> . . . Mr. Zettl has acknowledged providing the material to certain clients, but he maintains that this didn't violate any federal laws or regulations and didn't compromise national security.

From *Economics and National Security*. Mershon Center, The Ohio State University.

Situation #2: Whose Side Are You On?

Some of the nation's most important military decisions are made by a group known as the Joint Chiefs of Staff. The JCS is composed of a high-ranking officer from each of the major service branches. They are joined by one other high-ranking officer, known as the chairman, who heads this committee. The JCS makes decisions on many important issues of military strategy and national security. They also present strong recommendations to the President and Congress concerning the military budget.

One problem with the committee's approach is that each officer tends to support the budgetary and equipment requests from his own service branch. Furthermore, there is a tendency for each to support the requests from the other service branches to ensure support for his service's request.

William Lynn writing in the Atlanta Journal in March of 1985 described the situation in this way:

> As the Steadman Report on the military command structure pointed out, a chief cannot be expected to argue for additional divisions or Air Force wings when constructing a service budget and then agree in the joint forum that such programs should be dropped in favor of another service's programs. As a result, the Joint Chiefs are unable to help civilian leaders set cross-service priorities and make the necessary tradeoffs to construct the defense program and budget.

Situation #3: Everyone Gets an "A"

An interesting article by Arthur Hadley in The New Republic in May of 1984 points out another situation. In a number of cases that he observed personally, military officers were providing false information to their superiors, apparently on purpose. One such incident involved tests of the ability of soldiers in the field to use an anti-aircraft missile:

> . . . [A] general commanding an Army division in Europe told me proudly that the men in his division had achieved 95 percent hits with Redeye, a hand-held, infrared guided, anti-aircraft missile. His battalion commanders all confirmed this, without so much as a wink. Later, out on the range, I discovered the reason for the good scores. The little flying drones the men were shooting had been slowed down to 60 miles an hour. At speeds closer to that of an attacking aircraft, too many soldiers had missed the targets.

Contracting For New Weapons: Perverse Incentives

by Judith V. Reppy

Preview of Main Points

This lesson uses the example of cost-plus contracts for military goods to illustrate how incentives affect decisions by defense contractors. Students can test their understanding of the basic concepts through completing a series of exercises. The students should discover that some contracts establish incentives to increase costs of weapons systems (perverse incentives).

Connection to Textbooks

Textbooks describe prices, profit and economic incentives in the context of competitive markets. This lesson reviews these concepts by placing them in a different context.

Economic Concepts

Markets, prices, profits, and incentives.

Objectives

Students are expected to:

1. learn about different types of defense contracts and why there are often cost overruns;
2. analyze aspects of defense contracts using the concepts of markets, prices, profits and incentives; and
3. hypothesize about the relationship of defense contracts to national security.

Suggestions for Teaching the Lesson

Opening the Lesson

- Have the class read the first two paragraphs of the Handout. Make sure they understand how negotiated contracts differ from transactions in a consumer market. You may wish to mention other markets in which contracts are important, for example in the construction trade. An advanced class could discuss what products are likely to have negotiated contracts rather than set prices (goods that are one-of-a-kind or are under development).

- Have the students read the section on types of defense contracts. Review the types of contracts with the class. Then have the students answer questions 1-3 at the end of the section, which review prices and profit, as well as test understanding of the different contract types. These questions could be answered by each student individually or by the class as a whole.

- Ask the class why profits are an important incentive for a firm in a market economy to cut costs. Then ask them to consider what the incentives are for a contractor in the defense market. You might ask your class to list the ways in which defense markets differ from the markets described in their textbook (single customer, differentiated product, high degree of technological risk, negotiated prices, cost recovery).

Concluding the Lesson

- Tell the class that incentive contracts have not been successful in getting defense contractors to become efficient producers. Cost overruns are still very common. Some of the reasons are:

    1. Contract discipline is lax. Contracts are frequently renegotiated when there are cost overruns, so that even fixed price contracts do not penalize cost overruns. Contractors can "buy-in" at low prices and "get well" later. This means that they submit low bids to get the contracts and later negotiate higher prices.

    2. The Defense Department does not care as much about price as it does about performance. It is willing to pay a lot for technological advances.

    3. The contractors have other goals besides profits, so they do not care so much about cutting costs.

- Have the class read the next section of the Handout ("Incentives") and answer questions 4-6.

- Ask the class what they would do to encourage efficiency in the defense contractors. Have them distinguish between approaches that rely on incentives and trying to simulate market conditions and approaches that rely on regulation or coercion.

Suggestions for Additional Reading

Fox, J. Ronald. "Chapter XI." Arming America: How the U.S. Buys Weapons. Cambridge, Mass.: Harvard University Press, 1974.

Gansler, Jacques. "Chapter 3." The Defense Industry. Cambridge, Mass.: MIT Press, 1980.

Answers to the Handout

Contracts

1. (500 x $15) = $7500; (500 x 5) = $2500.
2. $150m + $10m = $160m.
3. $10m; 80% or $8m; $50m + $8m + $7m = $65m; $5m.

    Table completed:

    $50 million, $60 million, $10 million, $8 million, $2 million.
    $7 million, $5 million.

Incentives:

4. b, d, e are incentives that raise costs.

    a is an incentive that lowers costs.

    c is debatable. A firm may spend more on a current contract to be ready to bid on future contracts. Or it may try to cut costs to gain a reputation as being efficient. Most observers of the defense market favor the first statement.

Contracting for New Weapons: Perverse Incentives

In this lesson you will review the concepts of economic incentives, markets, and price in a different setting--the world of defense contracting. In a competitive market business firms are price takers. If a firm sets its prices higher than other firms in the market, no one will buy from it. So that firm must take the price set by the market. In order to make profits the firm must keep its costs as low as possible.

In the defense market there is only one customer, the Department of Defense. Most prices are set through contract negotiations between the Defense Department and individual defense contractors. The contract is a legal agreement that sets conditions of sale, such as the number of items, quality, delivery dates and price. Defense contracts are very complex, lengthy documents. However, in this lesson we will be concerned only with the pricing aspect of contracts.

Types of Contracts

The three basic types of defense contracts are:

1. **Fixed price contracts.** Of the three basic types these are most like prices in an ordinary market. The contractor agrees to deliver a product, for example, jet fuel, to the government for a fixed price which includes the contractor's profit. If the firm's costs are higher than expected, it might lose money. The contractor bears all the risk in this type of contract.

   Fixed price contracts are only suitable in cases where the product is already developed so that the contractor knows what his costs are. When the Defense Department wants to develop a new weapon, it doesn't know what it will cost because the weapon doesn't exist yet. The contractor doesn't know what price to bid on a fixed price contract in order to be sure of making money and staying in business. A different kind of contract is needed.

2. **Cost-Plus Contract.** In a cost-plus contract, the government agrees to pay all the costs of the project, plus a fixed fee which is the contractor's profit. If the project becomes too expensive, the government can terminate the contract, but this rarely happens. The government bears the risk, since the contractor can't lose any money. The problem with this type of contract is that there is no incentive for the contractor to be efficient, since no matter what the job costs, the government will pay.

3. **Incentive Contracts.** Incentive contracts were introduced to try to create incentives for contractors to be more efficient. There are many different kinds of incentive contracts, but all have the same feature of sharing cost overruns between the contractor and the government. The total cost of the project is estimated at the time the contract is negotiated and a target profit figure is added in. Actual costs will probably be different, usually higher than the estimate. If the cost is greater than the estimate, the government pays only part of the overrun, and the contractor has to pay for the rest. A typical sharing ratio is 80% government, 20% contractor. In this case the firm's profits will be smaller than expected. If the actual costs are less than the estimate, the contractor gets to keep part of the difference as extra profit.

Questions to Answer

1. A contractor signs a fixed price contract to sell 500 radios to the Department of Defense for $100 each. Production costs are $85 per radio. What is the contractor's total profit on this contract? If costs increase to $95 per unit, what is the total profit?

2. The Defense Department wants to develop a new radio for use on the battlefield. It signs a cost-plus contract with the XYZ Corp. to develop a prototype (model) radio. The contract is $50 million per year for two years, plus a fixed fee (profit) of $5 million per year. Two years later the company has spent $150 million but the radio is not yet ready. How much money does the government pay the company?

3. The Defense Department knows it has a problem. It rewrites the contract with XYZ Corporation as a one year incentive contract for $50 million plus $7 million profit. Overrun costs will be shared 80/20, or 80% paid by the government and 20% paid by the company. In the next year XYZ spends $60 million on the radio project. How much is the cost overrun? How much of the overrun does the government pay? What is the total amount that the company collects from the government in this year? What is the company's actual profit?

   HINT: Use the table below to help you work out the answers to this problem.

Contract Price (without profit)	Actual Cost (without profit)	Cost Overrun	Gov't. Share of Overrun	Company's Share of Overrun
______________	______________	________	____________	______________
	Contract Profit		Actual Profit	
	______________		____________	

Incentives

Incentives are the rewards or punishments that influence what people do. For example, a student may get a special treat for having a good report card. In a market economy, a firm has an incentive to keep its cost low in order to earn higher profits. But in the defense market this incentive is weaker, because the firm does not usually suffer a loss if its costs are higher than expected. It is very common for defense contracts to overrun their estimated costs by substantial amounts.

Questions to Answer

4. Below is a list of goals of the XYZ Corp. Which of these goals are incentives to spend money (raise costs)? Which of the goals are incentives to be more efficient (lower costs)?

   a) to make a profit

   b) to be a leader in radio technology

   c) to win more contracts in the future

   d) to keep its engineers busy

   e) to have a large research program.

5. If you were a defense contractor, which types of defense contract would you try to get? Why?

6. Do you think one kind of contract is better than others at promoting national security? Explain.

SECTION II

MICROECONOMIC CONCEPTS: MARKETS, SUPPLY, AND DEMAND

List of Lessons

This section has five lessons which illustrate how national security decisions are affected by market forces within the economy. The lessons are:

9. Buying the F-15: Why Weapons Cost So Much
10. New Technology and Risk in Defense Contracting
11. Recruiting a Volunteer Army: Supply and Demand
12. Markets and Strategic Materials
13. Resource Allocation and Defense Spending

Overview for Teachers

The operation of a market-type economy, freely competitive and without artificial constraints, can be described in relatively simple terms. The forces of demand and supply determine the movement of goods and services. The connecting link is price. Producers will supply what the consumers demand at a price that each feels appropriate--that is, at a price which provides an acceptable profit for the seller and an acceptable value for the buyer. Of course, few market economies operate that simply, especially not that of the United States. Competition is constrained not only by economic elements such as monopolies or oligopolies but also by various forms of government intervention.

Among the roles that the U.S. Government plays in the operation of the economy is that of providing public goods--that is, goods and services that are not provided by the market alone and whose benefits may be enjoyed widely regardless of whether or not one has contributed to their purchase. In market terms, the producer of such goods is the Federal Government and the consumers are the citizens of the United States. One such good is of course national security arising from the government's Constitutional responsibility "to Provide for the Common Defense."

As a public good, national security is an important force in the economy for at least three reasons. First, the price of national security in both absolute and relative terms is high, running today close to $300 billion in outlays. This represents about one-quarter of the total Federal Budget and approximately six to eight per cent of the Gross National Product.

Second, the components of defense spending are one of the most "controllable" elements of the budget. This means that defense funds are not allocated because of entitlement but rather at the discretion of the Congress when approving the budget. The Congress must, for example, authorize payment to Social Security recipients if they meet eligibility requirements; legislation entitles them to such payments. But Congress is not obliged to buy an aircraft carrier.

Finally, national security is economically important because spending on defense enters and acts upon the marketplace. Defense procurement comes from the private sector--defense industry--and military manpower comes from the overall labor pool.

The issue of procurement is of course a critical one. Recall that "budget is policy." What the Armed Services or other elements of the Department of Defense say is needed for national security and what the Congress actually authorizes for purchase are often quite different. The difference is usually, though not always, for economic reasons. **Lesson 9** examines the issue of the cost of procuring a weapons system--the F-15 fighter for the Air Force. This lesson introduces the concept of "unit cost" as an important factor in determining the overall cost of a weapon program. The lesson also shows how the budget process itself can have an impact on the cost of a system.

Lesson 10 looks again at another aspect of procurement that was introduced earlier--the system of defense contracting to provide military materiel. In particular, this lesson looks at the concept of risk. Defense procurement is the consequence of a budget that is short-term (the Defense Budget is now approved for two years) while the development of weapons systems is long-term. As a result there are a number of risks involved in defense procurement--technological, financial and political--including the possibility that a weapon, once built, will no longer be needed or wanted. The defense contracting system attempts to guard against the element of risk through both formal and informal mechanisms that affect economic decision-making.

Another aspect of defense economics at work in the market applies not to the procurement of hardware, but rather to the acquisition of military manpower. Military manpower, like all manpower in a market economy comes from the domestic labor pool which also operates under the competing forces of demand and supply. The decision after the Vietnam War to replace conscription--the draft--with an all-volunteer force therefore had important economic consequences. The Armed Services now had to compete in the labor market together with the rest of society. **Lesson 11** explores the economic impact of this outcome as a question of determining the market value (price) of military manpower in the form of wages.

Another area of market competition that has an important effect arises from the need for raw materials of "strategic" significance. These are materials that have direct application in the defense industry. However, such materials are also subject to competition from industry in general. **Lesson 12** addresses the problems posed by market conditions in the acquisition and use of strategic materials. A number of economic concepts are applicable to this case, including the role of resource substitution.

Lesson 13 explores the issue of defense spending in its broadest implications for the economy. Because of its size and relative controllability, defense spending can have an enormous impact on resource allocation within the society as a whole. Indeed, it has been the case in the course of overall economic decision-making in the post-war period that Presidents have employed defense spending purposefully to advance or retard the national economy. This lesson illustrates how shifts in defense spending affect the overall functioning of the market, and thereby underscores again the prominent economic role of national security.

Buying the F-15: Why Weapons Cost So Much

by Judith V. Reppy

Preview of Main Points

This lesson describes the cost to the Air Force of buying the F-15 airplane under different conditions. The case illustrates some of the factors that cause the prices of weapons to rise year after year. Exercises are provided to help the student understand the concepts of fixed cost, average cost and total cost.

Connection to Textbooks

The lesson provides an example of the importance of economies of scale in production and the effect of fiscal constraints on spending decisions. It can be used to enrich the treatment of production costs, especially fixed, average, and total cost.

Economic Concepts

Production, economies of scale, and inflation.

Objectives

Students are expected to:

1. be able to explain why unit costs increase as the total quantity produced decreases; and
2. calculate fixed costs, average costs and total costs for a hypothetical example.

Suggestions for Teaching the Lesson

Opening the Lesson

- Explain to the class that this lesson is about changes in the costs of production of the F-15 (a jet fighter plane) when the Air Force changed the number of planes it bought from year to year. It illustrates some of the reasons why the costs of national security are driven up from year to year.

- If the class has not previously dealt with the concept of average cost and total cost, these concepts should be introduced before they attempt the questions in the Handout.

Developing the Lesson

- Distribute the Handout, "Buying the F-15," to the class. Have the class read through the text and answer the questions at the end. If calculators are not available, encourage the students to do rough estimates for question 1.

- You might want to have the students work either in pairs or in small groups, especially less advanced students.

- Check the students' answers to questions 1-7. Make sure that the students understand that average cost increases when final costs are spread over fewer units.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Concluding the Lesson

- o Have the class discuss the answers that they have given to question 8. They should recognize both the temptation to stretch out programs in order to save money in the short run, and the effect on program costs of doing so. Ask the students what alternatives to program stretchouts they can think of.

- o Ask the students how, **if at all**, they think national security is affected by program stretchouts.

Suggestions for Additional Reading

Center on Budget and Policy Priorities. "The FY 1986 Defense Budget: The Weapons Buildup Continues." Washington, D.C., April, 1985.

Congressional Budget Office. "Tactical Combat Forces of the United States Air Force: Issues and Alternatives." Washington, D.C., 1985.

Spinney, Franklin C. ed. Defense Facts of Life. with comments by James Clair Thompson. Boulder, CO: Westview Press, 1985.

Answers to the Handout

1. $26.3m; $53.7m.

2. Inflation, changes in design.

3. a) $11m;
   b) $12m;
   c) $10.67m.

4. $144m; $144m.

5. a) $1,584m (144 x 11);
   b) 864m;
   c) $2,304.7m.

6. a) 5 yrs.;
   b) 10 yrs.;
   c) 3.3 yrs.

7. a) $7,920m (5 x 1,584);
   b) $8640m (10 x 864);
   c) $7,605.5m (3.3 x 2,304.7).

Buying the F-15: Why Weapons Cost So Much

The F-15 "Eagle" aircraft is the Air Force's most capable fighter plane. Its mission is air-superiority in air-to-air combat with enemy planes. The plane was introduced into service in 1975, and production is now expected to continue into the 1990's. The price of an F-15 in 1975 was $12.3 million per plane. By 1985 the price per plane was $49 million. This lesson describes the production history of the F-15 from 1975 to 1985 and the reasons why the price increased so much.

When the Air Force decided to develop a new aircraft to replace the F-4, it planned to purchase 749 planes altogether, 729 for active service and 20 for development and testing. Later the number was increased to 1,137 by the Reagan administration. The original plans called for a production rate of 9 planes per month or 108 per year. The manufacturer of the F-15, the McDonnell Douglas Corporation of St. Louis, Missouri, set up a production facility and purchased tooling based on that rate of output.

As often happens, however, the Air Force did not keep to its planned rate of procurement. In 1978 the Air Force's budget was not large enough to buy everything it wanted. This caused the Air Force to reduce the number of F-15s that it bought to 96 planes. It further reduced the number in 1979, 1980, 1981 and 1982. This is called a "program stretchout." The Defense Department buys fewer units per year for more years. The result is a smaller outlay of funds in each year, but a larger total cost for the program.

Table 1 shows how many F-15s the Air Force ordered in each year from 1975-1985, and the total amount of money budgeted each year for purchase of the aircraft plus initial spare parts. (More spare parts are bought later. The average service life of the aircraft is expected to be 20 years.) From 1980 to 1985 the highest production rate for F-15s was 7 planes every 2 months, less than half the rate that had been originally planned. And the cost per plane had increased to nearly four times the 1975 price.

Table 1

F-15 Quantities and Costs

Year	Number of Aircraft	Budget Authority (Millions of $)
1975	164	1916.6*
1976	108	1415.5*
1977	108	1435.7
1978	96	1604.0
1979	78	1387.3
1980	60	1052.7
1981	42	1103.3
1982	36	1186.8
1983	39	1594.2
1984	36	1624.5
1985	42	2255.8

* does not include initial spares.

Source: Department of Defense

From *Economics and National Security*. Mershon Center, The Ohio State University.

One reason for the increases in unit costs was inflation. Between 1975 and 1984 prices for aerospace products increased by 222 percent. Another reason is that the design of the F-15 was changed over the eleven year period, with newer models having improvements such as increased fuel capacity. These improvements added to the cost of producing the plane. A third reason was the stretch-out in schedule. In 1980 the Defense Department estimated that over half of the increase in cost of the F-15 plane after inflation was caused by schedule changes.

Why do unit costs increase when there is a stretchout in schedule; that is, when the rate of production drops below the planned rate? The most important reason is that some production costs are fixed and must be paid whether a few or many aircraft are produced. Property taxes, building maintenance, the salaries of the administrative staff are all examples of fixed costs. Other costs, like labor and materials, vary with the number of units produced. When fewer units are produced, the share of fixed cost charged to each unit goes up, and so unit cost increases, even though total program costs for that year are lower.

Program stretchouts are very common because they are a relatively easy way to save money in the short term without cancelling any programs. But they are very costly in the long run because each unit costs more than it would have under more efficient rates of production. And because of inflation, costs are higher in later years.

Questions to Answer

1. What was the average cost of an F-15 (plus spares) in 1981? What was the average cost in 1985?
2. Forty-two planes were produced in both years. Why do you think the planes cost more in 1985?
3. The numbers below are for an imaginary airplane.

   Production Costs
   Fixed costs/month: $12 million
   Cost of labor and materials per plane: $10 million
   How much does each plane cost if the production rate is:

   a) 12 per month
   b) 6 per month
   c) 18 per month
4. What are the fixed costs per year if 12 planes per month are produced? What are they if 6 planes per month are produced?
5. What is the total cost of airplane production in each year if the production rate is:

   a) 12 per month.
   b) 6 per month
   c) 18 per month
6. The total number of this aircraft to be produced is 720. How many years will it take to complete production if the production rate is:

   a) 12 per month
   b) 6 per month
   c) 18 per month
7. What is the total program cost for each of the production rates?
8. Why do you think program stretchouts occur? Use the answers to questions 3-7 to support your argument.

New Technology and Risk in Defense Contracting

by Judith V. Reppy

Preview of Main Points

This lesson introduces the notion of risks and ways of offsetting risks. The special risks of defense contracting are described, along with some of the institutional arrangements for handling them. Students are asked to consider how these risks contribute to the high costs of weapons.

Connection to Textbooks

This lesson could be taught in connection with textbook chapters on the business firm and decision-making.

Economic Concepts

Risk, decision-making by the firm, and technology.

Objectives

Students are expected to:

1. understand the concept of risk, and why people have to be compensated for bearing risk;
2. be able to describe the main types of risk in defense contracting; and
3. examine some of the ways in which the government and defense contractors respond to these risks.

Suggestions for Teaching the Lesson

Opening the Lesson

- Distribute the Handout to the class. Explain to them that some degree of risk is present in all activities, but that the defense business is considered to be particularly risky.
- Have the class read Section I of the Handout. Go over questions 1-3 with the class, making sure they understand that risk involves a possibility of loss, and that there is usually a variety of ways to avoid or minimize the costs associated with the loss if it occurs.

Developing the Lesson

- Have the students read Section II of the Handout. You may wish to have them work in small groups of three or four to answer questions 4-6 at the end. Go over the students' answers and their reasons for them with the class as a whole.

Concluding the Lesson

- Discuss question 7, Section II of the Handout with the class. They should recognize that some of the risk associated with defense contracting is unavoidable. Point out that the major question is who will bear the costs associated with risk.

Further Discussion

- To generate more discussion, you might wish to focus specifically on the different types of risk in defense contracts by asking whether the company or the public (government) should bear most of the risk. For example:

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

If the risk is financial, such as unexpected inflation, should the public or the company bear most of the risk? If the public, why should this business receive protection not available to other companies doing business in other fields?

Repeat for each of the other kinds of risk.

- You might also probe for student views on each of the strategies for minimizing risk. For example:

  Is it appropriate for defense contractors to lobby Congress? If not, why shouldn't they be allowed to lobby just as other businesses sometimes do?

Suggestion for Additional Reading

Kincade, William H. "Technology and National Security." Essentials of National Security : A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

This chapter discusses the underlying factors leading to high technological risk in weapons development.

Answers to the Handout

3. In a lottery, the risk is losing your bet. The larger the lottery prize the greater the chance of not winning. Thus, lotteries with greater odds of winning have generally smaller prizes.

4. Technical: Cost-plus contracts, contract change orders, company research programs.

   Financial: Escalation clause.

   Political: Links to Pentagon, political lobbying.

5. i. b;

   ii. d;

   iii. e;

   iv. c;

   v. c;

   vi. a.

   Note that v. is an example of costs being shifted **to** the defense contractor. In vi., the probability of technical failure is reduced by having two contractors work on the same problem.

6. In this question a variety of responses are acceptable. The risks are:

   a) political.

   b) financial.

   c) technical.

   d) technical.

New Technology and Risk in Defense Contracting

Section I: Risky Business

Few things in life are certain. Some risks, like the risk of being hit by lightning are so small that we pay no attention to them, at least most of the time. Others are important in everyday economic activity. A farmer doesn't know what the weather will be when he plants his crop. An investor doesn't know how the market will move when she buys a stock. A manufacturer doesn't know whether a new product will be popular when it is introduced. In each case there is a risk of loss as well as the possibility of gain.

Normally, people prefer a sure thing to a risky one of the same value; a premium has to be paid to get people to accept risk. For example, if you were offered two choices: a) getting $10 or b) getting $10 only if a flipped coin came up "heads," you would take "a" and not risk getting nothing if the coin came up "tails." You would expect a premium, say $10 more, to choose the coin flip because it involves much more risk. Furthermore, the riskier something is, the higher the reward will have to be to get you to accept the risk.

In this lesson you will learn about some of the special risks in defense contracting. When faced with risk people usually try to protect themselves from loss. The most common ways of doing this are:

- **Reducing the probability of the undesired outcome.** Sprinkler systems reduce the probability of severe fires.
- **Spreading the risk**. Buying insurance is one way to spread risk. Many people each pay a small fee into a common fund. When one suffers a loss, he is compensated for it from the fund. Having more than one source of supply is another example of spreading risk.
- **Shifting the costs.** For example, a product warranty shifts the cost of getting a defective product from the buyer back to the manufacturer.
- **Charging a higher price.** The larger the potential risk, the higher the reward needed to compensate for bearing it. Banks charge more on loans to high-risk business ventures than on home mortgages.
- **Leaving the market.** If the risk is too high, with no possibility of insurance or compensation, then no one will undertake it. For examples, business firms will not invest in countries where they think there might be a revolution.

Test Your Understanding

1. Name some risks that you face in everyday life.
2. What means do you have to protect yourself from risk?
3. If you buy a lottery ticket, what risk do you take? How is that risk reflected in the potential reward?

   Hint: If the chances of winning are greater, will the prizes be larger or smaller?

Section II: Risk in Defense Contracting

Developing new weapons is a particularly risky business. There are three main sources of risk for defense contractors.

1. **Technological Risk.** Developing new weapons is a big part of the defense business. The Department of Defense typically asks for improvements in the performance of new weapons, and this requires new technology. Whenever something new is being developed, there is a risk it may not work. (If we knew beforehand whether it would work, it wouldn't be new.)

2. **Financial Risk.** Like any other business, a defense contractor runs the risk of unexpected changes in his costs, for example, due to an increase in inflation rates. Since defense contracts often take several years to complete--building a ship may take as long as seven years--labor costs and the price of materials may rise considerably more than expected, cutting into the firm's profits.

3. **Political Risk.** Even if a new weapon works perfectly, the contractor cannot be sure that it will be funded for production. Congress may decide to cut the defense budget. Another weapon may be developed that does the same job. The military threat may change so that the weapon is no longer good enough.

The government recognizes that developing new weapons involves high risks and that, without special arrangements, it might not be able to get any manufacturer to undertake new projects. There are a number of special arrangements that help to offset the risks that defense contractors face. Some are listed below:

- **Cost-plus contracts** for weapons development. In a cost-plus contract the government agrees to pay all of the contractor's costs. Technological problems that arise are fixed at the government's expense.

- **Escalation clauses** in contracts. Even if the contract is not cost-plus, the government may agree to pay cost increases that are the result of inflation.

- **Contract change orders.** Descriptions of the work to be performed are changed if technical problems arise. For example, performance goals may be lowered or additional work at the government's expense may be authorized.

- **Political lobbying** to maintain support in Congress for defense programs.

- **Informal links** to offices in the Pentagon where decisions about weapons programs are made. Such links can provide valuable information about possible changes in weapons programs and can provide a chance for contractors to influence Pentagon decision-makers.

- **Company research programs** that study ideas for future weapons developments can be funded by the government. Such research reduces the probability of future technical problems.

Test Your Understanding

4. In the table below draw a line connecting each of the strategies that a defense contractor might use to offset risk to the type of risk the strategy will meet. Although some strategies are good for more than one kind of risk, draw only one line from each strategy to the type of risk it fits best.

Table 1

Representative Strategies	Type of Risk
Cost-plus contracts	Technical
Escalation clauses in contract	
Contract change orders	Financial
Political lobbying in Congress	
Links to Pentagon	Political
Company research programs	

5. Label each of the following with the appropriate letter according to whether it is an example of:

   a) reducing the probability of loss
   b) spreading the risk
   c) shifting the costs
   d) increased reward for bearing risk
   e) quitting the market

i. ___ A defense firm acquires a new division that sells in civilian markets.

ii. ___ The Defense Department pays a higher rate of profit on defense contracts that are not cost-plus.

iii. ___ A defense contractor stops selling simple tools, such as hammers and wrenches, to the Defense Department.

iv. ___ A defense contractor announces that it will accept only cost-plus contracts.

v. ___ A defense contract gives a warranty on the number of hours its product will operate without repairs.

vi. ___ The Defense Department gives identical development contracts for a new radar to two contractors.

6. You have been hired as an advisor by the Defense Products Division of contractor XYZ, which is developing the Nohit Missile for the Air Force. For each of the challenges to the missile program listed below, say what kind of risk is involved and choose an appropriate response to recommend to the XYZ Corp.

   a) Congressman Brown makes a speech using Nohit as an example of an unnecessary weapon.

   Risk: ______________________________.

   Your Response:

   ____

   ____.

   b) The price of titanium, which is used in manufacturing the Nohit, increases because of new environmental regulations affecting the process of titanium.

   Risk: ______________________________.

   Your Response:

   ____

   ____.

   c) The subcontractor for the guidance system of the Nohit runs into problems making the system work properly.

   Risk: ______________________________.

   Your Response:

   ____

   ____.

   d) The engine of the Nohit explodes in 2 of its first 3 operational tests.

   Risk: ______________________________.

   Your Response:

   ____

   ____.

7. How does the presence of risk add to the cost of weapons? Is there anything the government or the defense contractors can do about it?

Recruiting a Volunteer Army: Supply and Demand

by Judith V. Reppy

Preview of Main Points

This lesson analyzes recruitment of a volunteer army as an example of supply and demand in the labor market. Through a series of graphing exercises the students trace the effect of changing market conditions on the equilibrium wage for recruits.

Connection to Textbooks

All textbooks include sections on supply, demand, and market equilibrium. This lesson provides an opportunity to apply these concepts to a real life problem.

Economic Concepts

Supply, demand, equilibrium price (market clearing price), and graphs.

Objectives for Students

Students are expected to:

1. learn about the major factors affecting the supply of recruits to an all-volunteer army; and

2. use graphing techniques to analyze the effect of changes in market conditions on the equilibrium wage rate.

Suggestions for Teaching the Lesson

Opening the Lesson

- Students should already be familiar with graphing supply and demand curves and with shifts in supply and demand before attempting this lesson.

- Distribute Handouts 1 and 2 to the class.

- Explain that the lesson is an example of how the concepts of market supply and demand can be used to analyze the policy problem of recruiting a volunteer army.

- Read Handout 1 with the class. Have them make a list of the market supply factors and another list of market demand factors (paragraphs 3 and 4). You might also have the students list the Army's short and long run adjustments in paragraph 5.

Developing the Lesson

- Have the students read through the lesson and complete the exercises. Depending on the class, you may wish to do the first two or three exercises together as a review of supply curves.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

- Note that only case (d), an increase in base pay rates, involves a movement along the supply curve. All the other examples are shifts of the curves. Case (f) emphasizes the point that this is a segmented market. If standards are lowered the supply of potential recruits increases. Emphasize to students that the demand curve is shown as a vertical line because, in the short-run, recruiting goals are fixed. The wage rate is also fixed in the short run, so changes in market conditions create excess supply or demand, with a considerable time lag for adjustment. You might wish to call this condition "market disequilibrium" to emphasize the problem created.

- For an advanced class, you may wish to introduce the concept of induced demand: The Army's demand for recruits is an indirect effect of decisions on national security and the implied need for military forces. For example, if a small war were to occur, the demand for recruits would increase. Another example of induced demand is the demand for military uniforms, which depends on the demand for Army recruits.

Concluding the Lesson

- Ask the class to discuss what policies they think the government should follow to insure meeting the Army's recruitment goals. You may wish to hold a straw vote between some of the policies, such as raising base pay vs. recruiting more women.

Suggestions for Additional Reading

Cooper, Richard V.L. Military Manpower and the All-Volunteer Force. Rand Corp., 1977.

Cooper is a standard reference to the problems of the volunteer army.

Olvey, L.D.; Govden J.R.; and Kelley, R.C. The Economics of National Security. Avery Publishing Group, Inc., 1984.

This book has a chapter on the defense labor market.

Answers to Handout 2

1. a) SS shifts to left (decrease in supply).
   b) SS shifts to left (decrease in supply).
   c) SS shifts to right (increase in supply).
   d) Increase in quantity of recruits supplied (movement upward along original supply curve).
   e) SS shifts to left (decrease in supply).
   f) SS shifts to right (increase in supply).

2. Excess supply in cases c, d, f.

   Excess demand in cases a, b, e.

3. a) DD shifts to left (decrease in demand).
   b) DD shifts to right (increase in demand).

4. Demand for male recruits shifts to left (decrease in demand); equilibrium wage rate falls.

Recruiting A Volunteer Army: Supply and Demand

Background

Since 1973 the United States has had an all-volunteer army. This means that no one is forced to serve in the Army, as they could be, under a system of conscription (or draft). Instead, the Army must find ways to attract enough volunteers to fill its need for soldiers. With the help of advertising that you may have seen on television the Army recruits about 140,000 men and women each year to maintain its authorized level of approximately 2,150,000 military personnel.

The Army is an employer hiring in one portion (or segment) of the labor market, namely those persons between the ages of 17 and 21. The Army's success in filling its recruitment goals depends on conditions in that segment of the labor market, including the attractiveness of alternative employment. The equilibrium wage rate for this labor market is that level of pay plus benefits that allows the Army to recruit just the number and quality of soldiers it wants. Benefits are an important element of military pay, since recruits live on base, get free medical service, and in many cases, receive technical training as part of their jobs.

On the supply side of the market the most important factors are: (1) the numbers of people 17 to 21 years old; (2) the current level of unemployment in the economy, especially unemployment among young people; (3) the base pay rate offered by the Army; and (4) the pay rate offered by the civilian sector. During periods of high employment the Army has had trouble filling recruitment goals; it does much better when there is a lot of unemployment in the civilian economy and when Army base pay is relatively high compared to other entry level jobs. The long-term problem facing the Army is the declining size of the pool of 17-21 year olds because of the decline in birthrates in the 1960's.

The Army's recruiting goals, that is, its demand for labor, are set in the short run by: (1) the manpower levels authorized by Congress; (2) the current reenlistment rates; and (3) the attrition rate among new recruits. If many soldiers sign up for a second tour of duty, and if most soldiers make it through basic training, then recruitment goals can be lowered.

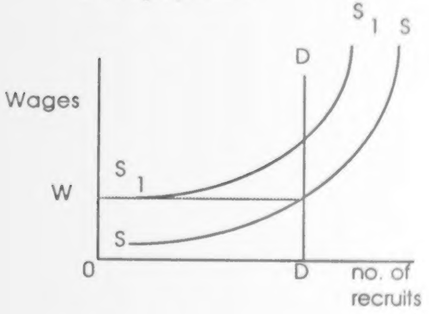
In the short run the Army can adjust to shortfalls (too few recruits) in recruits by increasing its advertising efforts, by lowering its standards for accepting recruits and by paying bonuses for reenlistment. If supply exceeds demand, the Army raises its standards and, if necessary, stops accepting recruits. In the longer run the military services adjust to the availability of recruits by requesting higher rates of base pay and by substituting capital, in the form of new weapons, for labor.

Exercises

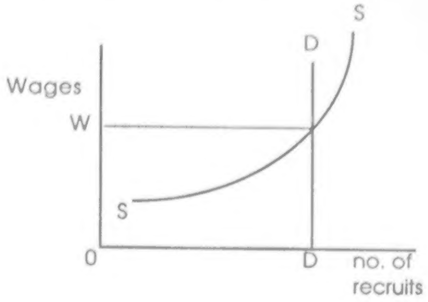
Since we are talking about a market, we can use standard techniques for graphing market responses to changes in the supply and demand of military recruits. In the questions below use graphs to illustrate your answers. The demand curves are shown as vertical lines because in the short-run recruiting needs are fixed.

1. Change the graphs below to show the impact on the supply or quantity supplied of Army recruits due to the specific changes in market conditions described in each case. The first one has been completed for you as an example.

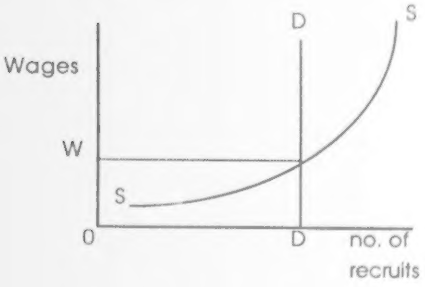
a) Decrease in civilian unemployment



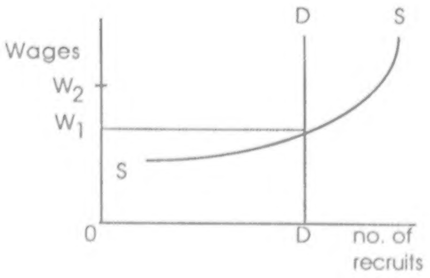
b) Increase in recruiting budget of the Air Force



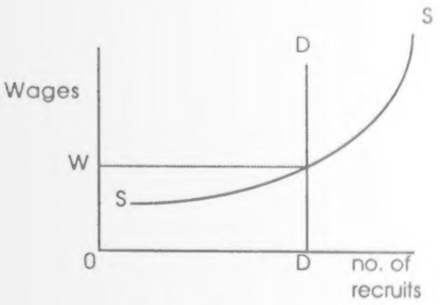
c) Increase in recruiting budget of the Army



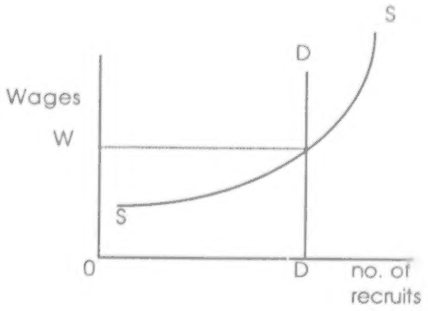
d) Increase in base pay rates from W_1 to W_2



e) Increase in wages at McDonald's



f) Lower standard for passing Army entrance test

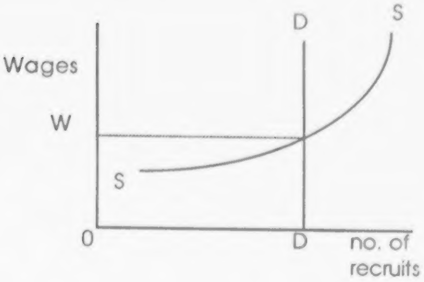


From *Economics and National Security.* Mershon Center, The Ohio State University.

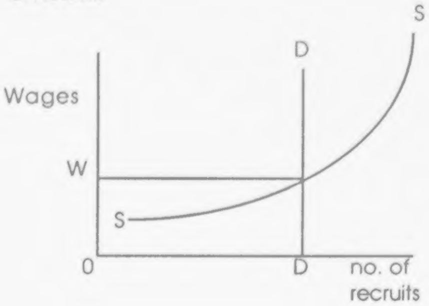
2. In the examples above there is a short-term disequilibrium in the market because wages and personnel levels are set by Congress in annual legislation. Which cases in question 1 result in excess supply? Which cases result in excess demand?

3. On the other side of the market, the government's demand for recruits is also affected by changing conditions. Fill in the graphs below to show the effects of the following changes:

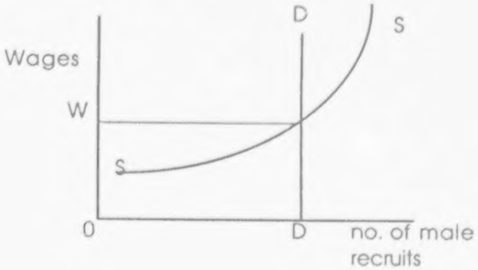
a) Increase in retention rate of enlistees



b) Increase in number of authorized divisions



4. One solution to the shortage of males aged 17-21 years would be to recruit more women. Is this a change in supply or demand? On the graph indicate the effect on the market for male recruits of increasing quotas for female recruits. Does the equilibrium wage increase?



Markets and Strategic Materials

by Steven L. Miller

Preview of Main Points

The uncertainty of the supply of strategic materials is a national security issue that concerns many. It is important to remember, however, that the use of strategic materials is a function of price. Because certain materials are purchased abroad and are vitally needed at present prices does not mean that the U.S. or any other country is helplessly reliant on the present suppliers. Higher prices or unavailability from present suppliers can call forth new producers and substitutes, as is illustrated here in the case of cobalt.

Connection to Textbooks

This lesson can be used with the standard textbook treatment of markets, supply, and demand.

Economic Concepts

Market supply, demand, price, substitute, and technological change.

Objectives

Students are expected to:

1. analyze changes in the market for cobalt, a strategic material;
2. determine that substitutes can replace some strategic materials; and
3. discuss circumstances under which substitution may not provide an adequate solution for providing national security in the event that a strategic material becomes unavailable.

Suggestions for Teaching the Lesson

Opening the Lesson

- Have the students read Handout 1.
- Next, the students should complete the fill-in-the blank exercise in Handout 2 to check their understanding of the reading.

Developing the Lesson

- Ask the students to define "strategic materials." Ask them to provide some additional examples.
- Have the students complete the graphing exercise in Handout 2.
- Discuss why strategic materials might be important to national security.

Concluding the Lesson

- Ask the students to list some factors that might limit or slow down a market response to a cutoff or sharply increased price for a strategic material.

From *Economics and National Security: Supplementary Lessons for High School Courses*,
1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

- Discuss the implications of such a slow response for national security.
- Ask the students to consider how changes in technology can cause changes in the relationships between nations. Point out that it works the other way as well: changes in international relationships can cause changes in technology.

Suggestions for Additional Reading

Harf, J.; Kincade, W.; and Trout, B. eds. Essentials of National Security: A Conceptual Guidebook for Teachers. Columbus, OH: The Mershon Center, 1988.

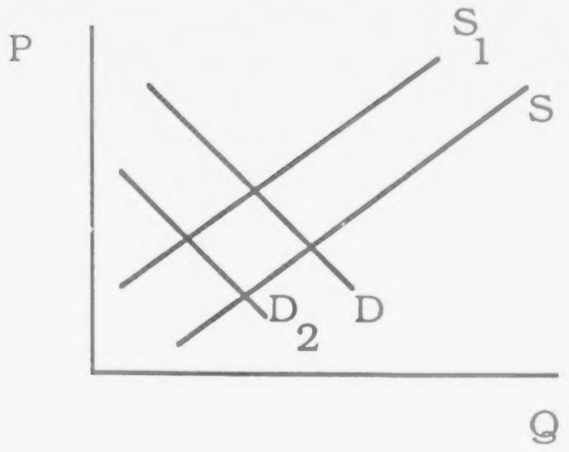
In this book see John L. Gaddis' chapter on "Conflict in the Modern Era," especially the section on resource conflicts. Also, William Kincade's chapter contains background on technology that could be helpful and B. Thomas Trout's chapter provides useful connections of the resource supply problems to international relationships.

Answers to Handout 2

Part I

strategic material, cobalt, imported, civil war, decrease, supply, increase, price, decrease, quantity demanded, substitutes, nickel, decrease, demand, fallen.

Part II



Markets and Strategic Materials

How to Cut Dependence on Strategic Materials

Some people are very concerned about certain materials, called **strategic materials**, that the U.S. produces little or none of, but that are necessary to build weapons. Because nearly all of these strategic materials must be imported, defense strategists are worried about what might happen if the supply of these materials is interrupted by a war, an embargo, or for some other reason. This reading is about what happened when there was a decrease in the supply of one of these strategic materials, cobalt.

In the late 1970's there was a civil war in Zaire that shut down the mines where cobalt was produced. Zaire was one of the few sources of cobalt in the world. Defense contractors needed the cobalt to manufacture jet engines because of cobalt's ability to withstand high temperatures. For example, the F100 engine made by Pratt & Whitney for F-15 and F-16 fighter jets requires 885 pounds of cobalt. As prices for cobalt increased, contractors became more concerned. They sought ways to produce engines that used less cobalt.

One solution was to find new methods of production that used less cobalt. For instance, "gatorizing" is a new way of making engine parts that wastes less of all of the metal components used to manufacture the parts. Parts that used to use 2,000 pounds of metals, including cobalt and other strategic materials, now require only 785 pounds.

Pratt & Whitney also found ways to substitute cheaper materials that were less vulnerable to decreases in supply. The combustor on the engine, where the fuel burns, is now made from an alloy made primarily from nickel. Nickel is readily available from Canada and is much cheaper than cobalt.

Another method was to change the design of the engines themselves. General Electric also produces engines for the F-16. It found a way to use less cobalt by cooling a critical part of the engines. They have used lasers to drill small "chambers" in the engine blades so that air will cool the blades better. Because the engine temperature is lower, less cobalt is needed. General Electric figures that it has reduced cobalt use in the engines by 30%.

After the civil war in Zaire was over, cobalt became more available again. However, the substitution of other materials such as nickel and the changes in the jet engine design and production have reduced the need for cobalt, so defense contractors are using less even though prices have fallen.

Source: "Cutting Dependence on Strategic Materials," Fortune, July 22, 1985, p. 69.

Part I

Fill in the blanks with the correct responses in the following paragraph. (All the terms to be used are listed below. However, some terms will be used more than once.)

Cobalt is a so-called ________________ because the U.S. uses it to produce weapons but does not produce any of it. Thus, all of the ________________ must be ________________ from other countries. There was a ________________ in Zaire that caused a(n) ____________ in the ________________ of cobalt. This caused a(n) ________________ in the ____________ and a(n) ________________ in the ______________________________. Over the longer run, contractors found ______________ for cobalt either in the form of replacement materials such as ______________ or changes in production and design. This has caused a(n) ____________ in __________. Because of these changes, cobalt prices have ____________.

civil war
imported
decrease
supply

fallen
quantity demanded
increase
demand

cobalt
strategic material
substitutes
nickel

Part II

In the space below, graph the changes that took place in the cobalt market. Label shifts in the supply and/or demand curves in the order in which they took place. For example, a change in demand would be marked as D_1. The next change (if any), let's say in supply, would be denoted S_2.

From *Economics and National Security*. Mershon Center, The Ohio State University.

Resource Allocation and Defense Spending

by Steven L. Miller

Preview of Main Points

The impact of defense spending is sometimes analyzed in terms of its effects on employment and prices. However, the effects of defense spending on resource allocation are more fundamental. This lesson uses the interconnected markets model as a means to help students diagram and understand economic changes caused by defense spending.

Connection to Textbooks

This lesson should fit well at the conclusion of the textbook treatment of supply and demand.

Economic Concepts

Supply, demand, markets, and price.

Objectives

Students are expected to:

1. graph the changes that take place in related markets due to a change in a defense industry market;

2. analyze some of the effects of spending on weapons on the allocation of scarce resources; and

3. hypothesize about the difficulties in increasing production during a period of mobilization.

Suggestions for Teaching the Lesson

Opening the Lesson

- Before using this lesson, the students should already be familiar with the competitive market model and should be able to use basic market (supply and demand) graphs.

- Review the concepts of market, supply, demand, and price, if necessary.

- Tell the students that they will be applying their knowledge of markets to figure out how a change in spending on a weapons system will affect other markets.

Developing the Lesson

- Present markets one and two of the Handout (already completed) as examples of what the students are to do. Note that students are to consider short run changes only and move only one line in each graph (either supply or demand but not both).

- Students should be told not to worry about trying to determine how much either supply or demand changes (i.e., the size of the shifts in supply or demand), but to concentrate on whether it is supply or demand that changes and whether the change is an increase or a decrease.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Concluding the Lesson

- Divide the class into pairs to complete the Handout. After the students have completed the Handout, instruct each pair to answer the following questions about each market:

  a. What happened to the price in the market?

  b. What happened to the quantity consumed?

  c. How did the use of resources in this market change?

- Discuss the following question: Assuming that the F-13 fighter is purchased by raising taxes, what are some of the ways in which other markets might be affected?

- Ask the students to list as many problems as they can think of in attempting to rapidly increase the production of F-13s if there should be a national emergency. Ask if they think markets should be used to allocate resources in a national emergency, or if some other method should be used.

Suggestions for Additional Reading

Harf, J.; Kincade, W.; and Trout, B. eds. Essentials of National Security: A Conceptual Guidebook for Teachers. Columbus, OH: The Mershon Center, 1988.

Two chapters in this book, William Kincade's, "Technology and National Security" and James Harf's, "Cooperation in the Modern Era" deal with some aspects of resource allocation and national security.

Answers to the Handout

3. Demand increases (shifts right); P up; Q up; more resources devoted to training pilots.

4. Demand increases (shifts right); P up; Q up; more resources devoted to producing fighter jet engines.

5. Supply decreases (shifts left); P up; Q down; less resources devoted to training maintenance workers for the airlines.

6. Supply decreases (shifts left); P up; Q down; less resources devoted to training airline pilots.

7. Supply decreases (shifts left); P up; Q down; less resources devoted to producing airline aircraft engines.

8. Supply decreases (shifts left); P up; Q down; less resources devoted to producing airline flights.

Resource Allocation and Defense Spending

This is an exercise in understanding how markets are related to each other and how changes in one market can affect many other markets as well. The exercise begins with the purchase of 188 F-13 fighters by the U.S. government. Your job is to figure out how the increase in demand for F-13s will affect some other markets.

There are eight markets represented by supply and demand graphs in this Handout. For each market you are to determine what change takes place and draw it on the graph. For example, you might think that more purchases of F-13 fighters will increase the demand for workers in the aircraft industry. This is shown as an increase in demand, as drawn in market number one. There will also be an increase in the demand for Air Force maintenance workers, as drawn in market two as an example.

Concentrate on whether supply or demand changes and whether the change is an increase or a decrease. Move either the supply curve or the demand curve (not both) only once. Do not try to figure out whether the changes are large or small.

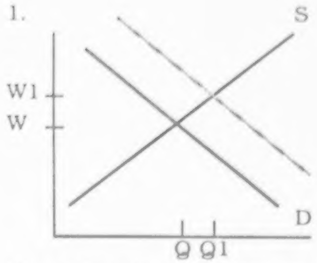
After completing the graphs, answer the following questions about each market:

a. What happened to the price in this market?

b. What happened to the quantity consumed?

c. How did the use of resources in this market change?

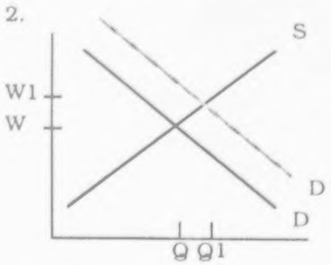
For example, the increase in demand in markets 1 and 2 causes an increase in price (circle the ↑ arrow) and quantity of resources used (circle the ↑ arrow). More resources will be shifted to training aircraft industry workers and maintenance workers.



W Aircraft Industry Workers

W ↑ or ↓

Q ↑ or ↓



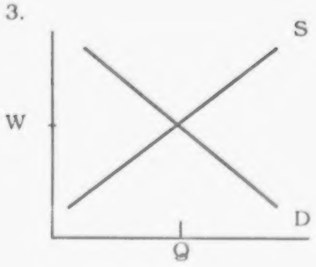
Air Force Maintenance Workers

W ↑ or ↓

Q ↑ or ↓

From *Economics and National Security*. Mershon Center, The Ohio State University.

3.



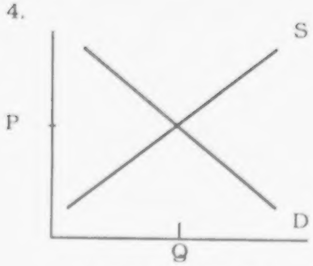
Air Force Pilots

W ↑ or ↓

Q ↑ or ↓

Change in use
of resources?

4.



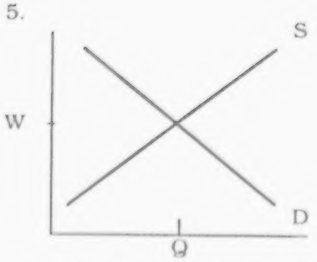
Fighter Jet Engines

P ↑ or ↓

Q ↑ or ↓

Change in use
of resources?

5.



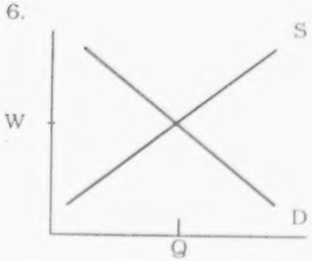
Airline Maintenance Workers

W ↑ or ↓

Q ↑ or ↓

Change in use
of resources?

6.



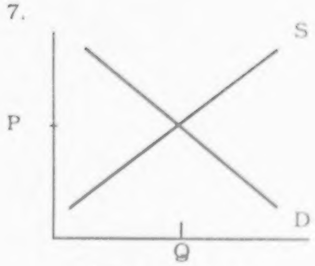
Airline Pilots

W ↑ or ↓

Q ↑ or ↓

Change in use
of resources?

7.



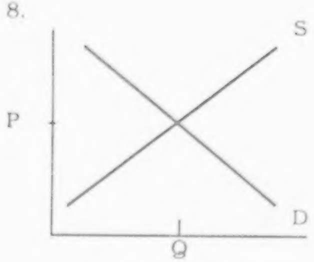
Airline Jet Engines

P ↑ or ↓

Q ↑ or ↓

Change in use
of resources?

8.



Airline Flights

P ↑ or ↓

Q ↑ or ↓

Change in use
of resources?

SECTION III

MICROECONOMIC CONCEPTS: MARKET STRUCTURE AND MARKET FAILURE

List of Lessons

The defense sector, although it both influences and is influenced by the civilian sector operates as a special case. This section has six lessons that examine the peculiarities of national security within the dynamics of the market. The lessons are:

14. Market vs. Non-Market Behavior in the Defense Industry
15. The Structure of the Defense Industry
16. Competition vs. Monopoly in Supplying Defense Materials
17. Collective Security and Free Riders
18. Basing the MX: Indirect Costs of Public Goods
19. Energy and National Security: The Economics of OPEC

Overview for Teachers

As has already been observed, simply because of the size of the annual outlays for defense, military spending would necessarily play a significant role in the market. For the same reason, the dynamics of the market will also have an impact on defense spending and procurement. However, the market structure is not only affected by action that occurs within the market itself. Non-market influences can cause what economists often refer to as "structural" adjustments to the market.

The defense sector is particularly prone to such adjustments. We have already seen how defense spending can be used to try to affect the overall economic environment. Additional influences can be brought to bear through the preparation of the defense budget within the Department of Defense and its further development at the White House and on Capitol Hill. The defense industry, responding to the economic motivation generated by market competition is drawn to these non-market influences in an effort to shape the market structure as favorably as possible.

The behavior of the market as it affects national security is peculiar in the respect that sales and competition are controlled almost entirely by a single buyer, the U.S. Government. **Lesson 14** introduces the consequence of this peculiarity through the relationship between market and non-market operations in the military sector of the economy. The lesson addresses the role of political influence in shaping the market. The resulting relationships are characterized in the notion of an "Iron Triangle," comprising the Defense Department, the Congress and defense industry. The non-market interaction of these three sets of actors--each varying in degree of influence, institutional objectives and relative authority--may determine the outcome of actual defense spending in the market.

The next lesson, **Lesson 15**, explores the nature of the defense industry in greater detail. The defense industry does constitute a discrete sector in the marketplace, differentiated both by the customer it serves and by the products it develops. While it is a complex industry, continuously integrated in some important ways with the overall industrial sector, the defense industry is also distinguished from that sector by the relative lack of competition. To make that point, this lesson looks at the concentration and specialization that characterize the defense industry as compared to industry at large.

Lesson 16 delves more deeply into the nature of competition as it operates in the defense industry. Both defense contractors and the military agencies responsible for negotiating contracts have been spotlighted recently for what appear to be outrageous conduct--simple tools at exorbitant prices, cost over-runs, and other seemingly needless expenses--resulting from the peculiar nature of defense production. This chapter presents some of the factors that underlie this conduct and considers the economic consequences of the alternative of greater competition.

Lesson 17 addresses yet a different problem. This is the problem of the "free rider." Though not peculiar to defense, the "free rider" problem does have some distinctive characteristics when operating in the context of national security. Because the United States has operated in the post-war period with a "forward strategy" of containment in implementing its defense policy (that is, moving its defense perimeter as far forward as possible to contain its adversary, the Soviet Union), it has consistently maintained an extensive overseas commitment in Europe and in Asia. However, by providing for its own defense the U.S. has assumed continuing responsibility for the defense of allies in these regions. Thus for the public good provided by the United States to its citizens, the nations of Western Europe and Japan have been able to "ride free," benefiting indirectly from the allocation of U.S. resources to defense and thereby investing proportionately fewer of their own resources for national security. This lesson illustrates the concept of the "free rider" and the consequences of this problem for the American economy and U.S. defense policy.

The other side of this concept involves not indirect benefits but indirect costs. As a public good, the implementation of defense requirements often entails measuring individual, local or regional concerns against the concerns of the nation as a whole. There are numerous examples of such considerations at all levels of government, perhaps the most familiar application is the governmental right of eminent domain. In the area of defense, these kinds of concerns often arise because of the location of military bases, which may be felt to impede local industry, infringe on property rights or impose other costs to the community such as increasing the need for educational or other services. **Lesson 18** examines these concerns in the case of the many proposals to base the MX missile (also called the Peacekeeper) in such a way as to make it invulnerable to enemy attack. These proposals were all ultimately unsuccessful--the MX was placed in existing Minuteman II silos--but their consideration turned on the issues of indirect costs to the community.

The final lesson in this section looks at resource availability. As presented in an earlier lesson, many materials are strategically important to the United States because they are located abroad. The U.S. generally relies therefore on imports for day-to-day requirements, with a "strategic reserve" to provide for military use in the event of emergency. However, the reliance on imports for day-to-day needs creates its own kinds of pressures. These pressures were brought home to Americans in the "energy crisis" of the 1970's when oil imports were under the control of the cartel known as the Organization of Petroleum Exporting Countries (OPEC). OPEC took advantage of prevailing conditions of the petroleum market to drive up the price of oil by restricting supply--an oil embargo--in the face of constant demand. The United States was a major consumer of OPEC oil production to meet its energy needs. The embargo of oil brought the U.S. economic hardship from increased oil prices. The embargo caused grave concern that the very security of the nation was being jeopardized. **Lesson 19** uses the energy crisis and OPEC control over petroleum resources to look at the impact of strategic materials on security.

Market vs. Nonmarket Behavior in the Defense Industry

by Judith V. Reppy

Preview of Main Points

Unlike firms in a competitive market, defense contractors can influence their sales through exerting direct political influence on their single customer. This lesson introduces the concept of nonmarket behavior of the firm and gives several examples of such behavior. Students are asked to consider how the "Iron Triangle" of Defense Department, Congress, and the defense industry affects national security.

Connection to Textbooks

This lesson could fit in with textbook discussions of markets and the behavior of the firm or in a section on government spending.

Economic Concepts

Markets and government spending.

Objectives

Students are expected to:

1. distinguish between the market behavior and the political behavior of a defense contractor;
2. understand the meaning of the "Iron Triangle"; and
3. hypothesize about the effects of the "Iron Triangle" on national security.

Suggestions for Teaching the Lesson

Opening the Lesson

- Distribute the Handout to the class. Review the concept of a competitive market, if necessary. Have the class read the first paragraph of the Handout and make sure they understand why, with many customers, a firm is indifferent to the identity of its customers and not able to influence them as individuals.

Developing the Lesson

- Have the students complete the reading and do the first exercise. Check their answers to make sure they have correctly distinguished between market and nonmarket behavior and can explain their answers. Questions 2, 3, 4, 5, and 6 are for class discussion.

- To help the discussion of question 2, you might want to use the following probe questions:

  Would the action have taken place if the market were competitive? If not, what might the company have done differently? Why did the company do what it did in each case?

Concluding the Lesson

- Make a list on the blackboard of the class's answers to question 6. Make sure they realize that the market structure with a single customer (**monopsony**) cannot be changed to make government-industry relations anonymous.

From *Economics and National Security: Supplementary Lessons for High School Courses*,
1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Suggestion for Additional Reading

Adams, Gordon. The Politics of Defense Contracting: The Iron Triangle. (New Brunswick, NY: Transaction Books, 1982).

Adams' book discusses the Iron Triangle and contains case studies of eight defense contractors.

Answers to the Handout

Question 1

a) nonmarket.

b) market.

c) nonmarket.

d) nonmarket.

e) nonmarket.

f) nonmarket.

g) market.

Market vs. Nonmarket Behavior in the Defense Industry

Business firms in competitive markets have many potential customers. (Remember, this is part of the definition of a competitive market.) The manufacturers in a competitive market do not generally have personal contact with their final customers. The retailers who sell the product to consumers may know who their customers are, especially if the product is the kind that is sold in small shops. For the manufacturer, however, the customers are essentially anonymous.

In contrast, defense firms sell to a single customer, the Department of Defense. Even sales to foreign governments are handled through the U.S. Defense Department. Defense contractors can try to increase their sales in the same way as firms in competitive markets. But, they can also influence their sales by going outside the market to lobby Congress or to influence decision-makers in the Department of Defense. They may even try to approach the president for his support on a major decision. In other words, a defense contractor can try to improve his company's sales through influencing the political process as well as by operating in the market.

In the political arena Congress is important because it votes on the defense budget. It also authorizes specific weapons programs, like the B-1 bomber or the MX missile. The Defense Department officials are important because they decide how many of which weapons to recommend to the President for inclusion in the budget that is sent to Congress every January. Usually, a weapons program must be included in the President's budget in order to be considered by Congress.

Exercises

1. Below is a list of actions that defense contractors have taken. These are real examples. Decide whether each action was primarily intended to influence sales in the market directly, through market means, or indirectly through nonmarket or political means. Be able to explain your answers.

   a) The Washington, D.C. representative of Rockwell Corporation took an important senator's staff assistant out to breakfast on the day his company's program was due to be voted on.

   b) General Dynamics lowered the price of its F-16 fighter plane when the Defense Department announced it will consider buying some of Northrop Corporation's rival plane, the F-20.

   c) Ford Aerospace hired four retired military officers who used to work for the Defense Department on an important Ford program.

   d) The vice-president of a major defense contractor left the company to become the Under Secretary of Defense for Research and Engineering, in charge of all new weapons developments.

   e) The prime contractor for the B-1 bomber distributed subcontracts on the project to companies in 49 states.

   f) The top 20 defense contractors gave $3.6 million in campaign contributions in 1984.

   g) A defense contractor developed an improved version of one of its products with its own money.

From *Economics and National Security*. Mershon Center, The Ohio State University.

2. How many of the above actions would make sense if there were many customers for defense products instead of just one?

3. In 1985 several aerospace companies, including the Boeing Company and Grumman Corporation, agreed voluntarily to repay the government for overpriced spare parts. This action followed considerable publicity over such cases as the $900 ashtrays and $600 toilet seats that had been sold to the Pentagon. Do you think this action is an example of market or nonmarket behavior? Why?

4. The Defense Department, Congress, and the defense industry have been called the "Iron Triangle" because of their closely interlocking interests. How is the fact that the customer is not anonymous important in maintaining the Iron Triangle?

5. In what ways is national security helped by the Iron Triangle? In what ways is it harmed?

6. What ways can you think of to improve the process of awarding defense contracts for weapons?

The Structure of the Defense Industry

by Judith V. Reppy

Preview of Main Points

This lesson provides a set of lecture notes on the structure of the U.S. defense industry, its major products, and its customer. The unique definition of the industry and its noncompetitive structure are emphasized. A student Handout provides data for the top 10 prime contractors in FY 1984.

Connection to Textbooks

Textbooks describe major U.S. industries and discuss various market structures. This lesson explains how the defense industry differs from other industries.

Economic Concepts

Competition, market structure, and concentration ratios.

Objectives

Students are expected to:

1. define the U.S. defense industry;
2. calculate concentration ratios for the defense industry and relate them to definitions of market structure; and
3. discuss whether the market structure of the defense industry affects national security.

Suggestions for Teaching the Lesson

Opening the Lesson

- Distribute the student handouts so that the class can refer to them while you lecture. You can use the lecture notes provided in this lesson. You may wish to review the concepts of market structure as defined by the number of buyers and sellers and whether the product is homogenous or differentiated. As an alternative to giving a lecture, the notes could be reproduced for the students to read.

Developing the Lesson

- Have the students look at Handout 1. Handout 1 lists the top ten prime contractors in fiscal year (FY) 1984. These are the largest military contractors and their names are probably known to your students. It may be that one or more of these contractors has a plant in your community; if so, it could serve as the focus of the class discussion.

- You might want to remind students that the government's fiscal year begins October 1st and ends September 30th of the year designated, in this case 1984. Also the table in Handout 1 lists sales in millions of dollars.

Concluding the Lesson

- Have the class answer the questions in Handout 2. The first question asks them to calculate the concentration of sales in the top 4 and top 8 defense contractors. If pocket calculators are not available, this calculation should be done by rounding and approximation rather than exact division.

- Question 5 is a question for class discussion. Students should relate their findings about the structure of the defense industry to the discussion in their textbook on market structure and competition.

- Questions 7 and 8 can be discussed in class. You might help students to see that the effect of the market structure on national security is not clear. The higher costs and lower quality typical of oligopoly could be offset by monopolistic power of the buyer to control costs and require high quality.

Lecture Notes

Defining the Industry

The United States, unlike some countries, relies on privately-owned firms, rather than on government-owned facilities, to supply military hardware such as tanks, aircraft, missiles and submarines. These firms make up the U.S. defense industry.

Most industries are defined by their products; for example, the steel industry is made up of firms that produce steel, the airline industry of firms that provide commercial air services. The defense industry is different: it is defined as those firms that sell to the Department of Defense (DoD). Any firm that sells to the Defense Department can be considered a member of the defense industry.

The defense industry contains **prime contractors**, those firms that contract directly with DoD to provide goods and services; **subcontractors**, which sell components such as engines, electronic systems, and computers to prime contractors; and **"third tier" firms**, which sell mostly standard items to both prime and subcontractors. Note that a firm may be a prime contractor for one weapon system and a subcontractor on another; about one half of all defense subcontracts are let to firms that are prime contractors. This lesson focuses on prime contractors.

Market Structure

The defense industry is a **monopsony** because there is only a single customer, the Department of Defense. Although the DoD has three military departments and thousands of purchasing officers, they are all governed by the same set of purchasing regulations. Even foreign military sales, which do involve multiple customers, are usually channeled through the DoD.

The market could also be labeled **oligopolistic**, because on the supply side there are relatively few major contractors. Handout 1 lists the top 10 prime contractors in fiscal year (FY) 1984, the main weapons systems produced by each company, and the value of prime contracts in FY 1984.

Note the importance of aerospace products: 9 of the top 10 contractors manufacture aircraft, missiles, or jet engines. Advanced technology is important in the defense market.

Concentration Ratios

Because of the special way in which the defense industry is defined, there is some ambiguity in labeling its structure. The usual measure of market structure is the concentration ratio, which is the ratio of sales of the 4 or 8 largest firms to total sales of the industry. Typical concentration ratios in 1972 for some oligopolistic industries are in the table below:

Industry	4 firm ratio	8 firm ratio
breakfast cereals	90	98
electric lamps	90	94
tires and inner tubes	73	90
aircraft (all types)	66	86

Thus, the top 4 breakfast cereal producers accounted for 90 percent of all domestic cereal sales in 1972. The top 8 tire manufacturers had 90 percent of all domestic tire and inner tube sales.

In comparison to these numbers, sales of prime contractors to the Department of Defense are not so highly concentrated. The 4 firm ratio in 1984 was 18.6% (Question 2). But if one looks at submarkets for individual products, for example, fighter aircraft, the level of concentration rises sharply.

This example demonstrates how the peculiar definition of the defense industry concentration depends in part on the availability of substitutes. The Defense Department may be less able than civilian customers to make substitutes. The output of a shipyard is not a substitute for tank production. Cargo aircraft do not substitute for fighter planes. Foreign products are not usually acceptable, as they are, for example, in passenger automobiles. So, low concentration rates for the industry as a whole are somewhat misleading.

Specialization

Finally, note that some prime contractors specialize in a narrow range of products, such as ships or fighter aircraft, whereas other firms are diversified. General Dynamics is the best example of the latter type of firm, with divisions producing submarines, fighter aircraft, and tanks.

Some firms have important civilian divisions, such as General Electric; others are almost entirely devoted to the military market, such as Lockheed and General Dynamics.

Conclusion

The defense industry is not like most other industries in that it is defined by the customer rather than the product. The industry is dominated on the supply side by a few large aerospace firms. As a result, competition in the classical sense of many buyers and sellers of an homogeneous product is lacking. Many of the problems in defense procurement are a direct result of this lack of competition.

Answers to Handout 2

1. Those firms that sell to the Defense Department.
2. 18.6%; 30.2%.
3. a) 5;
   b) 2;
   c) 2;
   d) 1;
   e) 2 (counting nuclear submarines);
   f) 7.
4. b, monopsonistic and c, oligopolistic.
5. b, monopsonistic, describes the buyer's side; c, oligopolistic, describes the seller's side.

The Structure of the Defense Industry

Ranked List of Top Ten Military Contractors, FY 1984

RANK	COMPANY	PRIME CONTRACTS IN MILLIONS OF $'S	MAJOR PRODUCTS
1.	McDonnel Douglas Corp.	7,684	fighter aircraft; missiles.
2.	Rockwell International Corp.	6,219	B-1 bomber; missiles; electronics and communications equipment.
3.	General Dynamics Corp.	5,951	fighter aircraft; nuclear submarines; missiles; tanks.
4.	Lockheed Corp.	4,967	cargo aircraft; missiles; electronic and communications equipment.
5.	The Boeing Co., Inc.	4,564	cargo aircraft; helicopters; missiles; electronic and communications equipment.
6.	General Electric Co.	4,514	jet aircraft engines; nuclear reactors for submarines.
7.	Howard Hughes Med. Inst.	3,231	missiles; radar; electronic and communications equipment.
8.	United Tech. Corp.	3,207	jet aircraft engines; helicopters.
9.	Ratheon Co.	3,093	missiles; electronics and communications systems.
10.	Litton Industries, Inc.	2,441	ships.

From *Economics and National Security*. Mershon Center, The Ohio State University.

Questions on the Defense Industry and National Security

1. Define the defense industry.

2. Department of Defense (DoD) prime contracts in FY 1984 totaled $133,571 million dollars. What fraction of total prime contracts went to the top 4 DoD contractors? The top 8 contractors?

3. Look at the main military products produced by the top 10 contractors. How many companies make

   a) aircraft?

   b) fighter aircraft?

   c) jet engines?

   d) tanks?

   e) ships?

   f) missiles?

4. Which of the following terms apply to the defense market?

   a) monopolistic

   b) monopsonistic

   c) oligopolistic

   d) competitive

5. Which of the above terms, if any, describes the buyer's side of the market?

   Which of the above terms, if any, describes the seller's side of the market?

6. Based on your answers to questions 1-3, what do you conclude about competition in the U.S. defense industry?

   In fighter aircraft?

   In missiles?

7. List any problems for the national security of the United States that you think could be due to the structure of the defense industry.

8. Does this structure enhance national security in any way?

From *Economics and National Security*. Mershon Center, The Ohio State University.

Competition vs. Monopoly in Supplying Defense Materials

by Steven L. Miller

Preview of Main Points

Recently, the Department of Defense has been countering the unfavorable media notice of the high cost of weapons with a well-publicized campaign to lower the cost of nearly everything it buys through the use of the competitive forces of the market. However, savings to the taxpayers is not the only issue. National security is affected by how well the Pentagon dollar is spent and the quality of what is purchased. This lesson serves as a springboard in exploring the application of the economic theory of monopoly to defense and national security issues.

Connection to Textbooks

This lesson fits well with the textbook chapter devoted to monopoly and other markets that do not fit the criteria of the competitive model.

Economic Concepts

Monopoly, competition, and economies of scale.

Objectives

Students are expected to:

1. identify and analyze the arguments raised against changing to a more competitive system of acquiring military supplies;

2. construct counter-arguments based on the theory of monopoly; and

3. examine the implications of the proposed changes for national security.

Suggestions for Teaching the Lesson

Opening the Lesson

- Students should have studied the section on monopolies in the textbook prior to using this lesson. If students are not familiar with economies of scale, you should provide them with a quick example that illustrates the concept.

- Ask the students if they are aware of any of the stories concerning seemingly outrageously priced military equipment. List examples on the board. Ask the students for some ideas they have that might make the price of the supplies lower.

- Explain that in this lesson they will look at the use of the forces of competition as a method for lowering the price of some of the things purchased by the military.

- You might point out that the production of engines for the F-16 fighter aircraft is one case where the Department of Defense is attempting to break out of the "sole source" method of contracting by accepting engines from more than one source.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Developing the Lesson

- Tell the students to imagine that they have been hired as economists in the Department of Defense. Their task is to write a response to the letter from Mr. Wright (see Handout) that answers the objections he has raised.

- Put the class in groups of four students to accomplish the following tasks:

  1. Identify the two proposed changes to which Mr. Wright objects.

  2. List the arguments he gives for thinking that the changes will reduce national security.

  3. Write a letter of response that counters his objections.

Concluding the Lesson

- Examine the arguments presented in the student letters. Match the students' arguments with those given by Mr. Wright.

- Ask the students whether they think Mr. Wright was right--that the new purchasing procedures could harm national security.

Suggestion for Additional Reading

Brady, Linda. "The Economics of National Security." Essentials of National Security: A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

Brady offers a good introduction to the problems of procurement and competition.

Competition vs. Monopoly in Supplying Defense Materials

Honorable Lucille Turner
Secretary of Defense
Department of Defense
Washington, DC 20301

Dear Madam Secretary:

I understand that you are undertaking a campaign to reduce the expense of some of the nation's weapons and military supplies by awarding more contracts on the basis of competitive bids and by using more than one supplier for some additional items. As the head of a major military supplier, I wish to point out that these proposed actions could be very dangerous for national security. Let me demonstrate why this is so. I will start with some objections to the idea of competitive bidding before looking at the problems of having more than one supplier on many of these projects.

Some of the weapons that are produced for the military are simply too complex for a truly competitive bidding process. These weapons evolve over a period of time with more sophisticated equipment frequently added at the request of the Pentagon. No bidding process adequately captures the changing nature of these weapons.

Furthermore, because the weapon that is to be delivered changes over time as features are added or modified, you must deal with a company that has the ability to manage the project, make the required changes, and deliver the latest in technical sophistication. Some companies might come in with lower bids, but they also might not have the experience, the size, and the technical capability to deliver the goods.

The most important factor that any contractor can offer is quality. It is a comfort to our fighting men and women to feel that their tools are the best, not necessarily the cheapest. After all, who wants to be flying a fighter at three times the speed of sound knowing that the plane wasn't necessarily put together by the best, but by the company that said it could do the job the most cheaply. You get what you pay for.

Let me raise a few objections to the idea of holding down prices by encouraging several suppliers of the same material to compete with one another. This is a fine idea in theory, but terrible in practice. First, you are likely to lose the advantages of large scale production. Most of the time the cost per weapon falls as the number of weapons produced increases because of economies of scale. However, if you split that production up between several producers, the advantages of competition will be swamped by the higher costs created by the absence of large scale production.

Second, handing out the work to several producers will discourage innovation. Producers will be reluctant to suggest design changes that incorporate the latest in technology because they realize that this new technology would be passed along to their competitors.

I realize why you are attempting to institute these cost-cutting moves. You are trying to get more bang out of the Pentagon buck. In your view, dollars that are saved in one area of the budget can be used to purchase something else that will enhance national security.

But let me repeat--this is not the right way to economize. The nation will be more secure if the Soviets and any other potential adversary realize that the American military is using the best quality weapons incorporating the latest technology.

No one wants a nuclear war. The best way to avoid one is to have the most of the best available. Our company is proud of our 45 years of supplying the U.S. with exactly that.

Sincerely,

Walter Wright

Walter Wright
Chairman and CEO

From *Economics and National Security*. Mershon Center, The Ohio State University.

Collective Security and Free Riders

by Steven L. Miller

Preview of Main Points

In trying to reduce the federal budget deficit, some officials in the U.S. government are looking at the expenditures for the U.S. military commitment to Europe. Some say the United States is spending far too much and the allies too little, and that the burden of collective security is not being shared equally. This might also be true in the Pacific where the Japanese enjoy the protection of the U.S. nuclear umbrella and Navy. As the students will see in this lesson, some officials believe these situations resemble free rider problems.

Connection to Textbooks

This lesson would fit best with the textbook sections on indirect benefits, social goods, or the functions of government.

Economic Concepts

Indirect benefits and free rider problems.

Objectives

Students are expected to:

1. describe the problem of spending in the NATO alliance and compare that with a previous free rider problem;
2. examine reasons for and against proposed action to remedy the problem;
3. cite evidence showing why the U.S. is or is not likely to reduce involvement in NATO; and
4. discuss the implications of free rider problems for national security.

Suggestions for Teaching the Lesson

Opening the Lesson

- If the students have not studied spillover or indirect benefits, an explanation with a few illustrations would be helpful.

- Distribute Handout 1.

- Read the section on "What's a Free Rider" with the students to be sure they understand the problem that is presented.

Developing the Lesson

- Have the students complete the "Using What You've Learned Questions" and discuss their answers.

- Especially important are the students' solutions to the John Doe problem. Most will involve government enforcement of a rule about John paying his fair share.

- Have the students read Handout 2 and answer the questions under "Free Riders and NATO."

Note: You might want to point out that some experts do not agree with the analysis presented in The Economist article. Some authorities believe that other measures show the burden-sharing in NATO to be more equal.

Concluding the Lesson

- Discuss the answers to the questions. Call attention to the difference in the government's ability to enforce a solution in this case compared to the John Doe case.
- Discuss the situation with U.S. security agreements elsewhere around the world. Ask the students if the U.S. has similar problems elsewhere. Discuss the implications for defense spending and national security in general.

Suggestion for Additional Reading

Mandelbaum, Michael. "Strategy in the Nuclear Age." Essentials of National Security: A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

See Mandelbaum's chapter for a concise background on NATO and NATO strategy.

Answers to Handout 1

1. Some students will realize that they can get a reasonable grade without doing any of the work.
2. It could, especially if several other students seem to be completing the work fairly well.
3. In this case they might be motivated by the desire to get a good grade. They also might not believe the other students have much to contribute.
4. Student answers will vary. Nearly all will focus on some way of either restricting benefits to those who work, or forcing everyone to contribute.

Answers to Handout 2

5. Some Americans believe that the European allies are not contributing their fair share to the defense of Europe.
6. One similarity is that the Europeans are realizing spillover benefits of the U.S. military deployment in Europe. One difference is that the allies are contributing to the NATO defense effort.
7. Reduce U.S. troops in Europe.
8. One difference is that the U.S. cannot enforce a requirement for military spending on its allies.
9. Reagan's Administration lobbied against Nunn's proposal.

Collective Security and Free Riders

What's a Free Rider?

Sometimes productive activity creates benefits that are enjoyed by people who are neither involved in producing the benefits nor paying customers. These people are known as "free riders." For example, John Doe works at the XYZ Company. The International Brotherhood of Widget Makers (IBWM) is the union that represents the XYZ workers in bargaining with the company. Let's assume that the IBWM successfully negotiates a wage increase for all of the widget workers. Suppose John is not a member of the union and pays no dues. He still receives the benefits of the union's efforts without having to pay. He is a free rider.

One problem with free rider situations is that they often lead to less production than there would be without free riders. When people do not get the full value of what they produce, they tend not to produce as much. Thus, things produced where there are free riders are generally "underproduced." There is less union activity "produced" because of free riders than would be the case if those who were members get all of the benefits with none going to free riders.

Another problem is that some producers of an activity where there are free riders see that they can also gain by riding for free. Like John Doe, they may try to get the benefits without paying the price. If enough people try to become free riders, the activity stops and so do its benefits. There must be large benefits to the remaining producers for the productive activity to persist in spite of increasing free riders.

Using What You've Learned

1. Suppose you are in a small group (6 to 8 students) in your class. You have an assignment to complete as a group. The same grade will be given to all of the members of the group. How could this create a free rider problem?
2. In this example do you think the number of free riders might increase? Why or why not?
3. In this example why do the producers of the benefits keep producing while not receiving all of the benefits?
4. What are some possible solutions to the problem of free riders faced by the students? By the IBWM?

Free Riders and NATO

The information in the news story below is about U.S. and European support of NATO. It refers to conventional weapons and forces. This means soldiers, tanks, aircraft, and other **non-nuclear** weapons. It also refers to a "nuclear tripwire." This means that the death of U.S. soldiers in a Soviet attack would ensure that the U.S. would use nuclear weapons in Europe, if needed. First, read the news story. Then apply what you have learned about free riders to the problem presented in the news story by answering the questions at the conclusion of the story.

"Should America's Allies Do More"*

In 1984, a vote in the U.S. Senate over an amendment to a defense spending bill was widely interpreted as a message to America's NATO allies that they must shoulder more of the burden of defending Europe. The amendment was offered by Senator Sam Nunn of Georgia, an influential member of the Armed Services Committee, whose opinions of defense matters are highly regarded.

His amendment would have required the U.S. to pull some of its soldiers out of Europe if the NATO allies did not increase their spending on defense. Mr. Nunn was distressed that NATO allies had not honored commitments made in the late 1970's to increase real defense spending (spending adjusted for inflation) by 3% per year. The U.S. had exceeded this target, but the average increase for Europe for the period was only 1.2% to 1.7% per year according to estimates by the Department of Defense. Mr. Nunn proposed that the maximum number of U.S. troops in Europe be reduced from 326,414 by 30,000 each year from 1986 through 1988 unless the NATO allies increased their spending by 3% more each year.

The senator argued that European reluctance to spend more on conventional defenses (non-nuclear defenses, such as soldiers, tanks, and fighter aircraft) means that they were settling for the nuclear "tripwire" strategy of the defense of Europe. This strategy depends on the notion that if NATO's conventional forces are overrun by the Soviets, the fact that American soldiers will have been killed in large numbers will mean that the U.S. will attack the Soviets with its strategic nuclear weapons. The theory is that since the Soviets think that a successful attack on Europe will force the U.S. to cross the "nuclear threshold," they are less likely to attack Europe in the first place. Senator Nunn argued that a "nuclear tripwire" could be provided by fewer American soldiers than were in Europe at present. The U.S. could better use these defense resources elsewhere if the allies were not serious about trying to defend Europe with conventional weapons.

Senator Nunn, known as a strong supporter of NATO, presented his amendment with reluctance. He did not expect it to meet with the strong support it generated in the Senate. He was trying to send a message to the NATO allies. However, only a strong lobbying effort by the Reagan Administration kept the amendment from passing. In the end a compromise amendment was passed that forbade any more American troops from being stationed in Europe and required the administration to report to Congress each year on how well the allies were keeping their commitments.

* "More Please," The Economist, June 23, 1984, pp. 26-7.

Apply What You Have Learned

5. What is the problem presented in the article?
6. How is this problem similar to the free rider problem? How is it different?
7. What did Senator Nunn propose to do about the problem?
8. How does Senator Nunn's solution differ from those used in cases such as that of John Doe?
9. How did the Reagan Administration react to Nunn's proposal?

Basing the MX: Indirect Costs of Public Goods

by Steven L. Miller

Preview of Main Points

The MX is a case wherein providing allegedly greater national security through a more secure nuclear deterrent may also generate indirect costs for people living in the area. This lesson explores the issues surrounding the costs and benefits of locating the MX in its "race track" mode as planned by the Carter Administration. It also encourages students to engage the larger question of what to do when the burden of national security is shared unequally.

Connection to Textbooks

This lesson could be used in conjunction with textbook sections on the functions of government, indirect costs and benefits, or public goods.

Economic Concepts

Public (social) goods, indirect costs and benefits, and economic equity or fairness.

Objectives

Students are expected to:

1. examine the reasons for proposing the MX missile system;
2. contrast arguments that claim the MX would produce indirect costs and indirect benefits;
3. decide what should be done in cases where providing for national security might create unequal burdens; and
4. discuss whether a balance of national security and fairness was struck in the MX case.

Suggestions for Teaching the Lesson

Opening the Lesson

- Review the definitions of indirect costs and benefits with the students. Tell them that they will be looking for examples of both in the argument about what to do with the MX missile. Point out that in this case the spillover costs arise from governmental rather than private activity.
- Have the class read the "Background on the MX" section of the Handout. Ask them to complete the short answer items in the "Checking What You Have Read" section.
- Discuss the answers to be sure that everyone understands the facts in the case. You might also want to discuss whether building the MX, as proposed, would make the nation more secure.

Developing the Lesson

- Ask the students to read the sections in the Handout on the economic arguments. Point out that not all of the arguments are necessarily valid and that not all are examples of indirect costs and benefits.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

- Have the students list those arguments that they believe are valid and those they doubt. Discuss their reasons for these judgments.

- Have the class identify the alleged indirect costs and benefits.

- Ask the students to reach a tentative conclusion on the MX based on the information at hand and have them complete the "Reaching a Decision" section of the Handout. Discuss what additional information might be helpful in reaching a more definite conclusion.

Concluding the Lesson

- Discuss if the MX would impose an extra burden on those living near the placement of the missile sites.

- Ask the class for some other examples of situations where providing for national security might place unequal burdens on members of society. Discuss what should be done in these situations.

- Read aloud "The Results" of the MX case. Ask the students whether they believe the best outcome was achieved in this situation.

Suggestions for Additional Reading

Gray, Robert. "Policy Making and National Security: Structure and Process." Essentials of National Security: A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

Gray uses the MX as the prime example throughout this chapter.

Mandelbaum, Michael. "Strategy in the Nuclear Age." Essentials of National Security : A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

See Mandelbaum for an excellent introduction to the national security issues surrounding the "survivability" of the MX.

Answers to the Handout

1. The Soviets developed the ability to put multiple independently targeted warheads (called MIRV's) on their missiles and increased their accuracy.

2. Increasing the number of ICBM's; relying on cruise and submarine launched missiles; and launch on warning.

3. It would provide greater security from Soviet attack for the MX ICBM's without giving up accuracy or violating the limits set by SALT II.

4. Answers will vary.

5. Answers will vary.

Basing the MX: Indirect Costs of Public Goods

Background on the "MX"

For many years the ICBM's (intercontinental ballistic missiles) in their concrete silos scattered around the United States were relatively safe from attack. A nuclear warhead's explosion could not knock out a missile unless the warhead landed very close. The accuracy of Soviet ICBM's was not good enough to be sure of landing the warheads close enough to destroy the U.S. missiles in their silos. Given the inaccuracy of the Soviet missiles, they would have to have many more of them to be assured of destroying the U.S. missiles in a nuclear attack.

Recently two important changes in technology forced U.S. military planners to reconsider the safety of the U.S. ICBM's. First, the Soviets achieved the ability to put several nuclear warheads on the same missile. These missiles are called MIRVs (multiple independently targeted reentry vehicles) Since each of the warheads could be directed at different targets, this new ability had about the same effect as a large increase in the number of missiles. Second, the Soviets achieved greater accuracy. As a result, officials in the U.S. grew concerned that the missiles in the U.S. arsenal might be vulnerable to a surprise attack.

Some U.S. officials were afraid that if the Soviets thought the U.S. missiles were vulnerable, the Soviets might be tempted to launch a surprise attack. The possibility of this happening increased whenever the Soviets felt that the U.S. might be preparing a "first strike" against Soviet missiles or when there were other tensions between the two countries.

Faced with this threat, U.S. officials had four choices that did **not** depend upon getting the Soviets to agree to arms limitation. The first two were rejected. Increasing the number of weapons was dismissed both because it could lead to an arms race and because it would break limits on the number of missiles imposed by the treaty that came from SALT II, the second Strategic Arms Limitation Talks. (This treaty was never ratified by the U.S. Senate but, as of late 1986, the U.S. abides by it.) Another option, to rely more upon cruise and submarine-launched ballistics missiles (which were less vulnerable to a Soviet attack), was rejected because these weapons were less accurate than the ICBM's.

Option three was to issue an order that U.S. missiles were to be "launched on warning." This means that the missiles would be fired sooner than they otherwise would be so that they would be gone before Soviet missiles hit. One problem with "launch on warning" is that it gives so little time for the President to evaluate the situation and decide what to do before launching the missiles. The U.S. government did not want to publicly reject this option because it tried to keep the Soviets uncertain about U.S. plans. However, the Carter Administration decided that it could not let the security of the nation's nuclear missiles rest on this increasingly unpopular and potentially dangerous policy. Something else had to be done.

The fourth option was to devise a way to set up the missiles so that they would be safer from attack. One such way was to "base" a missile so it could be moved quickly from one launch site to another. The idea was to build many launching places with real and dummy missiles shuttling among them. Because the Soviets would not know where the real missiles were, they would have to attack many more targets to be certain the real missiles were destroyed. For a successful first strike, the Soviets would have to build many more offensive weapons. This was something U.S. military planners did not believe the Soviets would do because it would violate the SALT II limits and would be very expensive. U.S. officials thought this plan would allow the number of U.S. missiles to stay within the limits of SALT II and yet keep enough of the missiles safe.

From *Economics and National Security*. Mershon Center, The Ohio State University.

After considering many ways to base missile systems, the Carter Administration adopted this "race track" method for basing a new missile, the MX. The decision to build the MX was not new. Since about 1971, the MX had been scheduled to replace the Minuteman missiles. The real innovation was the decision to shuttle about 200 missiles between some 4600 launch shelters. Military planners estimated that the Soviets would have to target about 9200 warheads (two for each launch site) to be reasonably sure of destroying the MX missiles. U.S. military planners thought that this was more than the Soviets would choose to target at U.S. ICBM's.

Checking What You Have Read

1. Why did U.S. missiles become more vulnerable to a first strike?
2. What options were rejected?
3. Why was the MX "race track" option selected?

Some Economic Arguments for the Opponents of the MX

Here are some of the economic arguments that were raised against the MX. Especially controversial was the question of where the missiles were to be located. The missile system would take up a great deal of space. Construction in areas in the west where siting was proposed would place extra demands on scarce water resources and could cause environmental damage. Furthermore, because the entire area would become a prime nuclear target in the event of a war, some people felt that economic development would be discouraged. These and other arguments were brought up by the opponents of the MX wherever a site was proposed. They said it was not fair that their region should have to bear these costs of national security when the benefits were available to everyone.

Some Economic Arguments for the Proponents of the MX

Those in favor of the MX tried to counter the opposition's arguments. They said that the construction of the launching sites and the bases to house military personnel would bring jobs and economic growth to the area. They disputed that many would acutally avoid developing businesses in the region because of a possible nuclear attack. Environmental damage could be almost totally repaired, argued the proponents, and even more jobs would be created in restoring the land after construction. They said the opponents were wrong to conclude that people in the region would have to bear extra economic burdens. In fact, they would reap additional benefits from the MX project.

Reaching a Decision

4. Based on the information available, do you think the MX should be based in the way selected by the military experts? Why or why not?
5. Suppose a project that is important to national security imposes an extra burden, economic or otherwise, on one particular group of people. What should be done about that? Should the project be canceled? Should extra compensation be given to the affected group?

The Results

The "race-track" plan for setting up the MX with dummy missiles and multiple launching places was dropped. Some of the people who opposed the MX did so on economic grounds. Others had different reasons but often adopted the economic arguments being raised against the MX. There were too many objections to the locations (several different places were suggested and rejected). Also, some thought the program was just too expensive. Congress decided to fund a greatly reduced number of MX missiles in conventional silos, replacing older missiles presently housed there.

Energy and National Security: The Economics of OPEC

by Steven L. Miller

Preview of Main Points

This lesson introduces students to the importance of economic considerations in national security issues and the concerns over reliance on imported strategic materials through a case study of the oil crisis and OPEC.

Connection to Textbooks

Most standard economics textbooks contain a section on monopolies and other noncompetitive market structures. Some contain sections specifically devoted to energy issues. Either would be a good place to use this lesson.

Economic Concepts

Monopoly, cartel, and price controls.

Objectives

Students are expected to:

1. identify the reasons for concern about national security because of the actions of OPEC during the 1970's;
2. consider the different evaluations of the international oil situation at that time; and
3. evaluate economic predictions by examining evidence.

Suggestions for Teaching the Lesson

Opening the Lesson

- Inform the students of the objectives of the lesson.
- Have the students read the first three paragraphs of Handout 1. Focus their attention on the seriousness of the situation that existed in the late 1970's and the potential threat to national security posed by the impending oil crisis.
- Ask the students what memories they have about this period of time.

Developing the Lesson

- Direct the students' attention to the questions at the end of Handout 1.
- Have the students finish reading this handout, answer the questions at the end and discuss their answers. You might have the students either answer the questions or conduct their discussion in small groups.
- Distribute copies of Handout 2 to the students. Examine the additional evidence with the students to be sure that they understand the data.

Concluding the Lesson

- Ask the students whether they think economic theory proved (or is proving) to be correct in this case. Solicit reasons to justify their conclusions.

- Discuss what implications the present energy situation has for U.S. national security.

Suggestions for Additional Reading

Gaddis, John L. "Conflict in the Modern Era." Essentials of National Security: A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

See especially the section where he addresses resource conflicts.

"The Shrieks of Arabia." Research Reports Vol. LII, No. 14, American Institute for Economic Research, July 15, 1985, p. 63-4; and

"OPEC Discovers the Perils of Price Fixing." Fortune Vol. 112, No. 2, July 22, 1985, p. 51-2.

Both articles give a recent analysis of the history of the cartel's problems.

Answers to Handout 1

1. Oil export reductions in the 1970's.

2. The large OPEC market share and huge price increases following OPEC production reductions.

3. Higher prices, lower output, shortages of oil products.

4. Invasion of the oil fields, strategic petroleum reserve, ending price controls.

5. Economists believed that the problem was one of an international cartel that would eventually fold being supported by price controls and other policies that hampered conservation and production.

6. Higher prices would both call forth higher production and lower consumption.

7. There is pressure for the cartels to crack from within due to cheating and from without due to competitors entering the market.

8. Reduced OPEC market share, cheating on quotas, possibly falling prices eventually.

Energy and National Security: The Economics of OPEC

Were the Economists Right?

Twice during the 1970's, the countries in the Organization of Petroleum Exporting Countries reduced oil exports. Some people believe OPEC did this to express displeasure with U.S. policies in the Middle East. The first time was in 1973 during the Arab-Israeli war when OPEC was producing 56% of all of the world's oil; the second in 1979 when Iran stopped producing after the fall of the Shah. These actions convinced many that OPEC was going to use oil as a weapon to force the Western governments to abandon Israel.

During the 1970's the price of a barrel of oil on world markets went from less than $10 to almost $40 (in constant 1985 dollars). The lines at gasoline pumps, the forecast of shortages of oil, and the specter of rapidly and continuously rising oil prices scared many people. The atmosphere was one of impending crisis and doom. Some information used in schools across the United States taught students that the world would run out of oil by 1985. Some experts predicted that the price of gasoline would rise to over $4 a gallon by the early 1980's.

Many of the poorer countries of the world were even harder hit. They had to cut back on fertilizer and pesticides made from oil. Their agricultural production fell as a result. The nightmare vision was of a world rapidly running out of oil with OPEC controlling most of what was left.

There was serious discussion of a possible invasion of the oil fields in the Middle East by the U.S. military to guarantee the West's oil lifeline. The development of a "rapid deployment force" (a military unit that could strike rapidly almost anywhere in the world) was partly the result of thinking that the oil fields might have to be taken by force. Some of our other policies were also based on the idea of a permanent energy problem. For example, Congress ordered oil to be purchased and stored in underground salt caves as a "strategic petroleum reserve" in case of yet another oil cut-off. Some economic problems including higher inflation and slower economic growth were created by the higher oil prices. For these reasons there was tremendous interest and concern about energy, oil prices, and the actions of OPEC.

However, many economists did not share in the sense of impending doom. They disagreed with other observers of the energy situation on several key points. A number of leading economists did not believe that OPEC was using their oil as a weapon. Rather, economists often pointed out that OPEC was acting in a way that is consistent with the economic theory of monopoly pricing. Monopolists restrict output not to punish customers but to get the combination of price and output that maximizes profits.

Furthermore, most economists did not believe that the world was running out of oil in the near future. They contended that the oil shortage was not being caused by sheiks in Riyadh, but by price controls imposed by politicians in Washington. Economists knew that when a price is held below the market's equilibrium price, a shortage of that product will develop. This seemed to them to be exactly what was happening in the market for oil.

In sum, from the point of view of economists in the 1970's, the energy situation need not produce a national security crisis for the U.S. The long gasoline lines and other energy shortages could be eliminated by removing price controls on oil and natural gas. As for OPEC, the economists' contention that it was simply a cartel was critical. (A cartel is a group of producers who have banded together to attempt to monopolize a market.) Economic theory and historical experience both predicted that cartels eventually collapse.

From *Economics and National Security*. Mershon Center, The Ohio State University.

This is partly because the cartel has no way to keep out the new competitors that will be attracted by the monopolistic profits. Another reason was that economists knew that the quantity of oil demanded was going to fall because of the sharply higher prices. People would find ways to conserve on oil consumption by using substitutes or simply cutting back on consumption. This was in sharp contrast to the estimates by other people of continuously growing demand for oil that ignored the law of demand.

Also, there is always pressure for a cartel to collapse from within. Prices can only be kept high if the cartel members agree to limit output. But each member of the cartel would do better by not limiting its output and selling all it can at slightly lower prices. Cheating is always a sign of a cartel in difficulty. If the economists were right, OPEC would fail and the national security issues that it was causing would be less urgent. As early as 1974 in a column in Newsweek economist Milton Friedman predicted the ultimate demise of OPEC.

But were the economists right? The crisis in oil markets following the oil embargo in 1973 was repeated by another crisis in 1979 after the fall of the Shah of Iran. What if returning to relatively free markets in energy failed to alleviate the shortage of fuel or did so only at prohibitively high prices? What if OPEC was not simply a cartel organized with the goal of achieving maximum profits? Maybe it was truly a political organization with the goal of shaping U.S. Middle East policy using oil as a weapon. If the economists were wrong it could ultimately mean war in the Middle East.

In a moment, you will examine some evidence about energy supplies, OPEC, and prices to determine for yourself whether you think the economists were right about OPEC. First, take a moment to consolidate your understanding of the issues and ideas involved by answering the questions below.

Apply Your Knowledge

1. What actions undertaken by OPEC made some people believe that the energy situation might produce a national security crisis?
2. What evidence was there that OPEC was able to exercise great control over the international oil market?
3. What were some of the economic problems caused by the higher price of oil?
4. What were some of the actions undertaken or considered by the U.S. government?
5. How did the view of many economists differ with that of other observers of the international oil scene?
6. Why did economists believe that removing the price controls would eliminate the shortage?
7. Why does economic theory predict that cartels eventually fail?
8. What evidence would you look for to confirm or refute the economic theory in this case?
9. Before looking at the evidence, do you think the economists were right?

Evidence About Energy Supplies

This handout presents different kinds of evidence on energy production and important events in OPEC and the international oil markets in recent years. Study the information in Table 1, Figure 1 and "Important Events" in order to find evidence that **confirms or refutes the predictions** made by economists concerning OPEC. The predictions were:

Prediction 1: The removal of price controls would eliminate the oil shortage.

Prediction 2: OPEC would eventually collapse.

Table 1

Oil Production by Major OPEC Nations

Country	1979 Production	1983 Production	August 1985 Production
Saudi Arabia	9.3	4.0	2.2
Iraq	3.5	0.8	2.6
Iran	3.1	2.5	1.5
Venezuela	2.4	2.1	1.9
Nigeria	2.3	1.0	1.2
Kuwait	2.2	0.7	.9
Libya	2.1	1.5	.9
United Arab Emirates	1.8	1.2	1.2
Indonesia	1.6	1.3	1.3
Algeria	1.2	1.0	.6

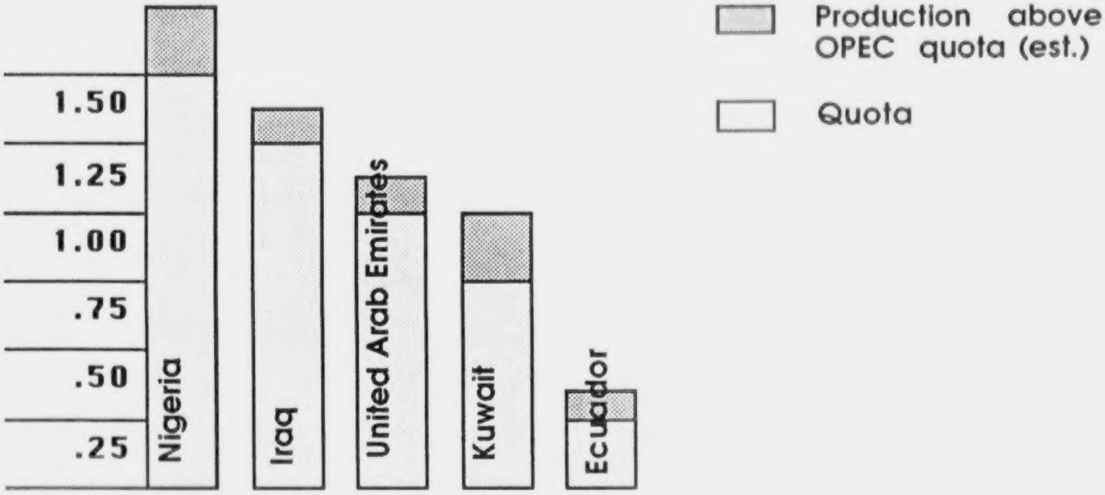
Note: Production figures are in millions of barrels per day (MBD). Gabon, Gatar and Ecuador less than 1 MBD.

Source: The Economist, January 29, 1983, p. 58; and February 8, 1986, p. 62.

Figure 1

Are OPEC Countries Maintaining Their Quotas?

1983 Crude Oil Production in millions of barrels per day



Important Events

1. The OPEC share of world oil production was about 30% in 1985.
2. The price of oil fell to less than $20 per barrel in the spot oil markets in early 1986 and to $10 per barrel by March. Prices recovered to about $17 per barrel by January 1987.
3. Since 1981 analysts have said that Nigeria and other members of OPEC have been cheating by producing more oil than is permitted by their OPEC quota and selling the oil for less than the agreed upon price.
4. Saudi production fell to 2.5 MBD (million barrels per day) in 1985. The Saudis themselves have been accused of cheating by bartering oil for aircraft which leaves the real selling price of their oil in doubt.
5. Two OPEC meetings in 1985 failed to bring agreement on new prices and OPEC quotas. Meetings in 1986 were also ineffective. The last meeting in December of 1987 set conditions not agreed to by Iraq and are not expected to last.
6. World consumption of oil has fallen sharply since 1979. U.S. consumption fell 21% between 1978 and 1983 after having risen 9% the preceding 5 years.

SECTION IV
MACROECONOMIC CONCEPTS

List of Lessons

This section uses national security issues to illustrate a number of macroeconomic concepts. There are six lessons that focus in a variety of ways on the impact of defense spending on the economy as a whole. The lessons are:

20. When a Base Closes: Two Case Studies
21. Macroeconomic Effects of Defense Spending: Vietnam
22. The Impact of Military Spending on Employment
23. Defense Spending and the Federal Budget Deficit
24. Where Are Defense Dollars Spent?
25. Is National Defense Being Overproduced?

Overview for Teachers

There are many different ways that national security decision-making can have an impact on the economy, some less direct than others. When it comes to the determination of how the resources allocated to defense will be distributed (or redistributed) within the society, for example, there is obviously great potential for economic reward. The economics of defense spending are therefore competitive in a separate, usually politically dependent way. Congressmen and Senators are notoriously interested in defense issues whenever the prospective economic rewards (or deprivations) will be felt within their respective districts or states. A Representative opposed to military spending on every other occasion will thus tend to support any project that brings money and jobs to his or her own district. While such conduct reflects the political motivations of seeking re-election, it also represents a real concern for the impact that the distribution of defense dollars can have at the local as well as the national level.

Lesson 20 illustrates the impact of defense spending with what has become a more frequent occurrence in recent decades, the closing of a military base. When a military base is closed, depending on its size, there are usually severe economic consequences. There is loss of revenue to the surrounding community both directly and indirectly. Not only is there the loss of jobs on the base itself, there may also be unemployment in the community caused by the disappearance of one of its major consumers. It is in the economic interest of the government to try to moderate those consequences. It is also in the political interests of the main parties involved. Since budgets must be approved in Congress, the Executive Branch generally finds it prudent to ease the impact (although an administration may of course punish a hostile member of Congress by closing a base in his or her district). And Representatives and Senators hoping for re-election will have the same goal. The economic reasoning that surrounds such a closing is explored in this lesson.

The next lesson looks at a different level of economic impact: What happens to economic resources when a nation engages in a war? **Lesson 21** uses the case of the Vietnam War as the context in which to explore this issue. Economic equilibrium is an important element of maintaining the economic health of a country. It is also difficult to achieve. Among the many factors that can upset the equilibrium is government spending.

Government fiscal policy attempts to maintain economic equilibrium by controlling the flow of income and expenditure in the economy. An external force, like war, which demands government spending on military goods, can severely disrupt both the equilibrium of the economy and the government's fiscal options for controlling it. The Vietnam War is a good case of this phenomenon at work. Increased spending on defense necessitated by that war soon became a contributing factor in a growing inflationary spiral. Eventually control of that spiral came from a reduction in defense spending, but that in turn had an impact on options available to policymakers in addressing the issues of U.S. policy in Vietnam.

A similar concern is treated in **Lesson 22.** It addresses the relationship between defense spending and employment. It was noted earlier that one of the political motivations for defense allocations by the Congress is the perceived economic gains resulting from defense contracts within the home district of the Senator or Representative. Underlying defense spending therefore are assumptions about the positive economic consequences of jobs created by defense programs. This lesson provides a means to assess some of those consequences--looking at the indirect employment as well as the direct employment consequences--and examines challenges to the contention that defense spending, as opposed to other kinds of spending, is the most effective way to create additional jobs.

Lesson 23 explores yet a third aspect of the instrumental role of defense spending. Since defense is to such a large extent composed of controllable elements it appears then as a highly visible and relatively flexible budgetary instrument. When faced with the increasing problem of the current growth of the Federal budget deficit some therefore identify defense spending as both the cause and the solution of the problem. Others contend, however, that this view is flawed, because the real increases in the deficit are attributable to the uncontrollable entitlement programs. This lesson presents versions of each of these views and supplies a framework with which to analyze them.

Lesson 24 looks at some of the domestic political ramifications of defense spending. Once money has been allocated for defense, then the complex process of deciding who will receive the contracts for those defense dollars begins. It has already been stated that this process tends to reflect political motivations. One might hypothesize that the more evenly the benefits of defense spending are distributed, the wider the potential basis of political support. But of course there are also considerations of economic impact as well. This lesson explores the issue of equity in geographic distribution of defense dollars nationwide.

Lesson 25 develops the macroeconomic issue of national security as a public good. As with most public goods it is difficult to place a social value on defense spending. Once again the fundamental economic question of fulfilling the Constitutional obligation of providing for the "common defense" is posed: "How much is enough?" Presumably the test of not being enough is defeat or perhaps even simply the necessity to engage in a war or conflict. But it is far more difficult to determine when too much is being spent. Some argue that "too much"--that is, overproduction of the public good of national security--is to be measured in terms of opportunity costs for other public goods. Every dollar spent on defense is a dollar unavailable for some other social program. However, this leaves open the issue of how one determines which of these social goods is to be valued more highly and how to go about doing it.

When a Base Closes: Two Case Studies

by Judith V. Reppy

Preview of Main Points

This lesson provides real life examples of the effects of government policy on employment. Two case studies of military base closings provide a contrast in type of community, importance of the base to the local economy, the ratio of military to civilian jobs at the base, and general economic conditions at the time of closing. Both communities have succeeded in attracting new uses for the base facilities, but neither has succeeded in replacing all of the lost jobs.

Connection to Textbooks

The lesson can be used with textbook discussions of the role of government in the economy, employment and unemployment, and economic growth.

Economic Concepts

Opportunity costs, government intervention costs, and the employment multiplier (for advanced classes).

Objectives

Students are expected to:

1. identify the impact on the local community of a military base closing;
2. describe the role played by government in the adjustment period following the closing; and
3. recognize that general economic conditions affect the success of the adjustment process.

Suggestions for Teaching the Lesson

Opening the Lesson

o Distribute copies of Handouts 1-4 to the class. Point out on a map the location of Mobile, Alabama and Sault Sainte Marie, Michigan. Make sure that the students see that both locations have good transportation facilities, but otherwise are quite different.

Ask the students to read Handout 1. Point out the questions they will be answering, as they read the case studies. Also point out the tables in Handout 4 that students are to complete after reading the case studies.

Developing the Lesson

o Have the students read the case studies in Handouts 2 and 3. The students should fill in the tables presented. A more advanced class could be asked to go to the library to find out about the total population, labor force, and principal industries in Mobile and Chippewa County today.

o Then lead a class discussion on the questions under "Questions for Discussion" in Handout 4. Some of the points to be made in the discussion of questions 1-3 are the following:

1. Military personnel are transferred away when the base closes, whereas the local employees usually remain in the local labor force.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

2. Both local and federal government played important roles in the development efforts at the two bases. The most important form of government aid was the implicit federal subsidy in transferring land and buildings at less than market price. Note the importance of local groups organizing to develop a plan and seek out various other types of government aid.
3. Discussion of this question should bring out the importance of the general level of economic activity to the success of the adjustment to a base closing. A distinction can be made between general fiscal policies that affect the economy as a whole and governmental policies targeted to specific localities.

Concluding the Lesson

- Return to the question posed to the students at the beginning of the case study: Should communities fear the loss of a military base? Ask them to consider what closing a base means to a local community in terms of the economic concepts of opportunity costs and economic growth.

Background Information for Teachers

For more advanced students you may want to introduce the concept of the employment multiplier. The employment multiplier will help students see that the impact of spending at a base differs between military personnel, who spend much of their income on the base in the commissary, and civilian employees who spend their money in the community where they live. The employment multiplier is the ratio of the total number of jobs created by the base to the number of direct jobs plus the jobs induced in the local economy by the spending of persons employed at the base on locally produced goods and services. Estimates of the employment multiplier range from 1.3 to 3.0, depending on local circumstances. Thus, a multiplier of 2.0 means that the total jobs created by the base will be twice the number of direct jobs.

The numbers given in the case studies for jobs lost and jobs created are for direct jobs only.

Suggestion for Additional Reading

Office of Economic Adjustment, Department of Defense. "Summary of Completed Military Base Economic Adjustment Projects." November 1981.

The Office of Economic Adjustment has prepared a number of free publications on base closings. The above article is perhaps the most useful.

Answers to Handout 4

1.	**Brookley AFB**	**Kincheloe AFB**
Year Closed	1969	1977
Civilian jobs lost	12,300	737
Military jobs lost	1,070	3,074
Total jobs lost	13,370	3,811
New Jobs	6,500	fewer than 450

2.	**Brookley AFB**	**Kincheloe AFB**
Government uses	education airport park	airport prison sheriff's office
Private uses	aircraft engines manufacture	building materials manufacture tool making housing development ammunition manufacture

When a Base Closes: Two Case Studies

Military bases can be an important source of jobs and income for the communities in which they are located. Besides the money that soldiers may spend off the base, the base employs local workers in maintenance and service jobs. The federal government contributes to the costs of services supplied by local government, such as schools. For these reasons people usually oppose plans to close a nearby military base, even if the base is no longer needed for national security reasons.

The federal government helps communities that are losing a military base. The Office of Economic Adjustment in the Department of Defense helps to develop coordinated plans for the use of the land and buildings that are vacated. Often the property is sold to the local community at a reduced price. Grants are available for planning and for improvements to the water and sewer lines, roads, etc. During the 1970's about $80 to $90 million a year was spent on assistance to communities that had lost military installations. However, many of these federal assistance programs have been reduced since 1980.

Should communities fear losing a military base? An economist would look at the opportunity costs of the base as well as its direct benefits to the community. What other needs could the land and people employed at the base serve? The relative size of the base is also important: how many jobs are at stake compared to total local employment? Finally, is the economy growing, so that new jobs are easy to find, or is it in decline?

This lesson describes two different actual base closings and what happened afterwards. As you read the case studies you should think about the following questions:

1. How important was the base to the local economy compared to other economic activities?

2. How strong was the economy at the time that the base was closed?

3. What did the federal government do to help with the economic adjustment? What did the local government do?

Case One: Brookley Air Force Base, Mobile, Alabama, 1969

In 1964 when the Air Force announced its intention to close Brookley Air Force Base, the base provided 11 percent of the jobs in the Mobile area and 79 percent of the income from federal sources. The base occupied more than 2000 acres of land inside the city limits. It was like a small city, with an airport, streets, water and sewer lines, and 300 buildings, including some housing units.

A strenuous political effort to reverse the decision to close Brookley was not successful. In 1969 the base closed, resulting in the loss of 1070 military jobs and 12,300 civilian jobs, or 13,370 altogether. This was the largest loss of jobs from a base closure in the United States in the period since 1961. Moreover, while many of the lost civilian jobs were highly skilled jobs in aerospace specialties, the other major employers in Mobil were in the pulp, paper, and timber industries.

The local community responded by forming a planning committee that came up with a comprehensive land use plan for the former base. The city paid the Federal government $1 for 1,312 acres of land, with runways and buildings for development as a municipal airport. It bought a further 392 acres at fair market value for an industrial park and a smaller parcel of 24 acres at half-price for a recreational park. Another 327 acres with buildings was transferred to the University of Southern Alabama at zero cost.

Teledyne Continental Motors, which makes light aircraft engines, began moving into empty Air Force buildings in 1966, before the base was officially closed. The company simply took over the existing facilities for engine testing and overhaul, and it hired many of the skilled workers who were being laid off by the Air Force. It is the largest industrial tenant in the industrial park, but it has been joined by many smaller companies, which manufacture a variety of products. There are about 15,000 students studying at the University of Southern Alabama campus. The large homes that housed the commanding officers of the base are now fraternity houses. By 1981 there were 6,500 jobs at the former base, about half the number that were there at the time of the base closing.

Mobile gained a valuable asset in 1969 when it acquired the land and buildings at Brookley Air Force Base at a bargain price. The community was helped in the transition period from 1965 to 1969, when the base finally closed, by a booming national economy. Although economic growth had slowed by 1969, the South was still growing relatively faster then most other sections of the nation. The new industries that have located at Brookley Industrial Park provide diversity for the local economy, and many observers now think that the city is better off than it was before.

From *Economics and National Security*. Mershon Center, The Ohio State University.

Case Two: Kincheloe Strategic Air Command Base, Sault Sainte Marie, Michigan, 1977

Kincheloe Strategic Air Command Base was, until 1977, the major, steady employer in Chippewa County, a sparsely populated area of Michigan's Upper Peninsula. The local unemployment rate was about 20 percent, and rose to over 25 percent in winter. The 737 civilian jobs, and 3,074 military personnel at the base indirectly supported many jobs in the nearby communities.

Kincheloe covered 5,000 acres, with runaways and many buildings. It had 1000 homes, for military personnel, and recreational facilities for the soldiers and their families. It had good transportation facilities, with access to Lake Michigan as well as air, road, and railroad routes.

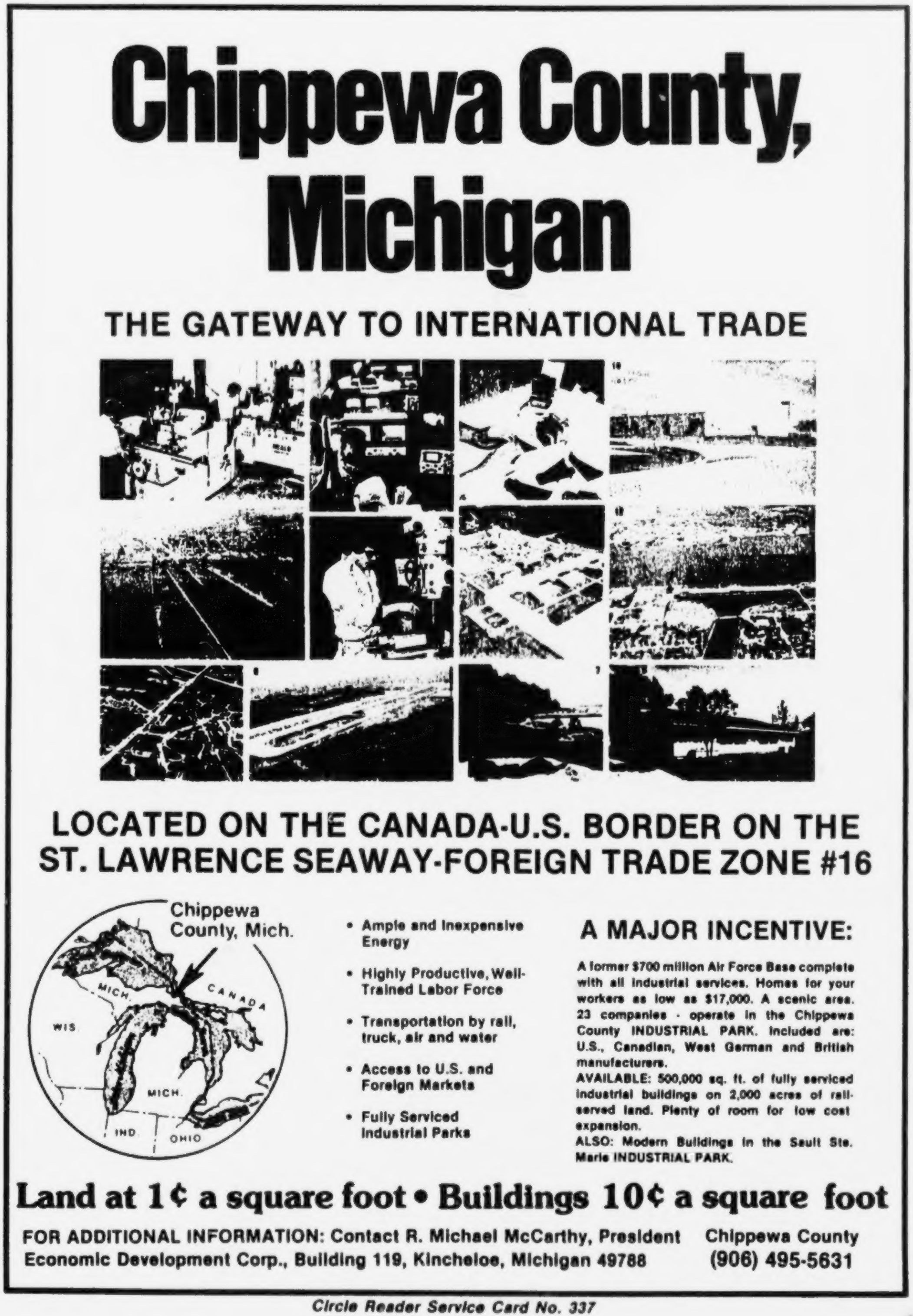
Local reaction to the announcement that the base would close in 1977 was near panic. An unemployment rate of over 30 percent was forecast (in fact the rate dropped slightly to 18 percent in 1978). At first there was little or no cooperation among local groups concerned with development of the base for civilian use. But eventually an organization was formed and a marketing effort to "sell" the facilities to prospective users was begun. The advertisement on the next page is an example of the communities' promotional effort.

The chief asset was the building space, which the county was able to offer to companies at about 10 cents per square foot, which was much cheaper than the going rate for commercial rentals in that area. A number of tenants now occupy the former base. The largest tenant is the county itself: there is a new county airport, the county sheriff's department and a medium security prison. But private companies have also located at Kincheloe, including companies that manufacture building materials, a tool maker and an ammunitions manufacturer that took over the former nuclear warhead storage area. There is also a housing development.

By 1981 there were 950 jobs at Kincheloe, more than the number of civilian jobs lost when the air base closed. However, many of these jobs are county jobs that would probably have existed elsewhere in the county anyway. Also, the induced jobs created by the spending of the servicemen who had been stationed at the base have not been replaced.

The national economy was experiencing high rates of inflation from 1978-1980 and real economic growth was only moderate. Moreover, the regional economy of the Midwest was performing less well than the nation as a whole. It seems that Kincheloe has done well to replace so many of its lost jobs.

From *Economics and National Security*. Mershon Center, The Ohio State University.



Chippewa County, Michigan

THE GATEWAY TO INTERNATIONAL TRADE

LOCATED ON THE CANADA-U.S. BORDER ON THE ST. LAWRENCE SEAWAY-FOREIGN TRADE ZONE #16

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A MAJOR INCENTIVE:

A former $700 million Air Force Base complete with all industrial services. Homes for your workers as low as $17,000. A scenic area. 23 companies - operate in the Chippewa County INDUSTRIAL PARK. Included are: U.S., Canadian, West German and British manufacturers.
AVAILABLE: 500,000 sq. ft. of fully serviced industrial buildings on 2,000 acres of rail-served land. Plenty of room for low cost expansion.
ALSO: Modern Buildings in the Sault Ste. Marie INDUSTRIAL PARK.

Land at 1¢ a square foot • Buildings 10¢ a square foot

FOR ADDITIONAL INFORMATION: Contact R. Michael McCarthy, President Chippewa County Economic Development Corp., Building 119, Kincheloe, Michigan 49788 (906) 495-5631

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60C

Source: NAID in Review, Department of Defense, 1983.

Reviewing Facts

1. Fill in table showing the important facts for each case.

	Brookley AFB	Kincheloe AFB
Year closed		
Jobs lost		
Civilian		
Military		
Total		
Number of new jobs		

2. List some new uses for both bases in the space below

	Brookley AFB	Kincheloe AFB
Governmental Uses		
Private Uses		

From *Economics and National Security*. Mershon Center, The Ohio State University.

Questions for Discussion

1. Does it make any difference if the jobs lost when a base closes are military transfers or civilian jobs? Why?

2. What role did the government play in redeveloping Brookley AFB? Kincheloe?

3. What do you think would have happened without government help?

4. Job and land use are two important themes in base closings. Which do you think was more important in Mobile? Why? Which was more important in Kincheloe and Why?

Macroeconomic Effects of Defense Spending: Vietnam

by Steven L. Miller

Preview of Main Points

The health of the nation's economy is a national security issue in that a strong economy provides a strong base to support a nation's policies. However, sometimes the military or defense operations undertaken create serious problems in maintaining economic stability. Such was the case in Vietnam.

Connection to Textbooks

Every economic textbook has sections devoted to inflation, fiscal policy, and monetary policy. This lesson will fit well after covering these sections.

Economic Concepts

Inflation, recession, fiscal policy, monetary policy, economic indicators.

Objectives

Students are expected to:

1. use data and macroeconomic concepts to decide what fiscal policy should have been undertaken during the war in Vietnam;
2. use data to determine what policies were actually undertaken; and
3. discuss the implications of economic stability for national security.

Suggestions for Teaching the Lesson

Opening the Lesson

- You should already have taught students about inflation, monetary policy and fiscal policy before beginning this lesson. Inform students about the main points of this lesson.

Developing the Lesson

- Distribute copies of Handouts 1 and 2 and **follow these steps.**

  1. **Read through the "Introduction"** in Handout 1 with the students to be sure they understand what they are to do.

     It might be helpful with some students to check on whether they can interpret the data in Table 1. Especially, check to make sure they understand each of the economic indicators presented.

  2. Have each student **read Decision Set #1 and attempt to define the economic problem.** Stop and review the students' definition of the problem.

     The definition of the problem should be: **To find a way to increase the spending by government for the war without causing inflation.** Make sure students understand why this was the problem and all have this recorded correctly before they proceed.

3. Have students **read Decision Set #1** by following the instructions on Handout 1.

4. Have students **read Decision Set #2 and attempt to define the economic problem**. Stop and review the students' definition of the problem.

   The definition of the problem should be: **Inflation was increasing despite tight monetary policy in 1966 that produced a mini-recession.** The added spending for the expanding war effort combined with the greatly increased level of spending for domestic programs was providing too much economic stimulus.

5. Have students **complete Decision Set #2** by following the instructions in Handout 1.

Concluding the Lesson

- Distribute Handout 3 and display it on a transparency. Let the students compare their decisions and guesses about the administration's decisions with the actual decisions. You might ask students whether they agreed with the policies undertaken.

- Discuss the question of the relationship between economic health and national security.

Suggestion for Additional Reading

Dornbusch, Rudiger, and Fischer, Stanley. "Chapter 10." Macro-economics. McGraw-Hill: NY, 1981.

Dornbusch and Fischer give a succinct macroeconomic history of the period.

Macroeconomic Effects of Defense Spending: Vietnam

Introduction

In the mid-1960's America's involvement in Vietnam deepened. The greater military commitment meant a tremendous cost of lives and wounded that was plainly visible, and a less obvious economic cost as well. How would you have handled attempting to finance the war effort? In this exercise you will examine some of the data and decide what action you would have taken.

It might help to imagine that you are working in the Johnson Administration (1963-68) and are periodically asked for your advice. Your task will be to (1) define the economic problem involved, (2) identify options to deal with the problem; and (3) select an option after considering the consequences. During this exercise you will use the *"Decision Record"* to record your decisions each time you make one. You will then have a chance to check your decision with the actual decision made.

One option will not be open to you: to discontinue the war effort. The decision has been made that the national security depends on the U.S. successfully prosecuting the war and that any economic cost is justified in the effort.

The Data for Decision Making

Table 1

Changes in Economic Indicators for 1963-1969

	Calendar Year						
Indicators	**1963**	**1964**	**1965**	**1966**	**1967**	**1968**	**1969**
% change federal spending	3.5	4.7	16.0	14.0	10.3	4.4	8.4
% change nondefense spending	8.3	7.5	12.0	10.7	12.4	8.2	16.6
% change defense spending	-2.6	.8	22.1	18.6	7.6	-.8	-3.5
% change real GNP	5.3	6.0	6.0	2.7	4.6	2.8	-.2
% change CPI	1.3	1.7	2.9	2.9	4.2	5.4	5.9
% change employment	2.3	2.6	2.5	2.0	2.1	2.6	1.0

All data annual rates of change

Source: Federal Reserve Bank of St. Louis

Decision Set #1

Examine the data in Table 1. See if you can pick out the first year of the expansion of the U.S. war effort. Record the year on your decision sheet. What has been happening to federal spending during the preceding year(s)? Suppose that a tax increase would be very unpopular with the voters and that the administration has undertaken many domestic programs including the "war on poverty," an attempt to see that all Americans have decent food, housing and medical care. What is the economic problem as you see it? Record your definition of the problem on the *Decision Record*.

What are the **fiscal** policy options available to you to deal with the problem? For example, one option might be to increase taxes. Record at least three options on the *Decision Record*.

What do you think the economic consequences of each of the options will be? Based on those consequences, choose one of the options and record your choice. ALSO look at the data for the next two years and see if you can determine what the actual decision was. Record your guess about what the actual decision made by the Johnson Administration was.

Decision Set #2

Examine the data in Table 1 and see if you can identify a growing economic problem resulting, at least in part, from the decisions made by the administration through 1967. It may help you to know that the Federal Reserve was so concerned about the economic situation that it ran a policy of "tight money" that resulted in a "mini-recession" in 1967 (this recession lasted only one quarter, the first three months of 1967). What is the economic problem as you see it? Record your answer on the *Decision Record*.

What are the **fiscal policy** options available to you to deal with the problem? **Note:** This time include reduced spending on defense among the options. Record at least three options on the *Decision Record.*

What do you think the economic consequences of each of the options will be? Based on those consequences, choose one of the options and record your choice. **ALSO** look at the data for 1968 and see if you can determine what the actual decision was.

Conclusion

What economic consequences did you expect from the policies actually undertaken in 1968? Examine the data. What was the condition of the economy in 1969?

Decision Record

Decision Set #1

Year of expanded war effort: ____________

Economic Problem:

Options (1)

(2)

(3)

Option chosen:

Guess about actual decision:

Decision Set #2

Economic problem:

Options (1)

(2)

(3)

(4)

Option chosen:

Guess about actual decision:

Actual Decision

Decision Set #1

The war effort expanded in 1965. Note the increase in defense spending in that year.

The problem was to find a way to increase the spending by government for the war without causing inflation.

Options available include:

1) increase taxes;
2) cut spending on domestic programs; or
3) do nothing.

The option chosen by the Johnson Administration was to do nothing. Thus they had to finance some of the government's spending by borrowing rather than increasing taxes.

Decision Set #2

The problem was that inflation was increasing despite tight monetary policy in 1966 that produced a "mini-recession" in early 1967. The added spending for the expanding war effort combined with the greatly increased level of spending for domestic programs was providing too much economic stimulus.

Options available include:

1) increasing taxes;
2) cutting spending on domestic programs;
3) cutting spending on the military; or
4) doing nothing.

The Johnson Administration cut military spending by 1968. It also proposed a tax increase in January of 1967, to become effective in July. Congress was reluctant to pass this legislation, however, and delayed acting until April of 1968. They passed a tax increase which was retroactive to January 1.

The Impact of Military Spending on Employment

by Judith V. Reppy

Preview of Main Points

This lesson introduces the student to the controversy over the impact of military spending on employment. In the lesson the economic concepts of aggregate demand and employment are linked to a specific government program. People in favor of military projects often give job creation as a reason for going ahead; critics of military spending argue that, dollar for dollar, fewer jobs are created by military spending than by other kinds of government spending. The lesson also illustrates the way in which statistical evidence may be selected to support opposing positions.

Connection to Textbooks

The lesson is related to textbook treatments of government expenditure and of Keynesian policy for stabilizing aggregate demand.

Economic Concepts

Aggregate demand, employment averages, and distribution about the average.

Objectives

Students are expected to:

1. understand how government spending for military purposes translates into direct, indirect, and induced employment in the civilian economy;
2. compare different estimates of the number of jobs created by military spending; and
3. explain why the estimates differ.

Suggestions for Teaching the Lesson

Opening the Lesson

- Write the number $1.7 billion on the chalkboard. Tell the students that this is the sum of money that the Defense Department spent to purchase M-1 tanks (Abrams tanks) in fiscal 1985. Ask the class how this money is spent: who gets it? (The prime contractor for the Abrams tank is General Dynamics.) With the money from the Defense Department, the contractor buys steel, engines and other materials and parts needed to produce the tank. It hires workers to work in its assembly plants (direct employment). Its subcontractors and suppliers also hire workers as a result of the tank order (indirect employment).
- Explain that a parallel situation exists for all of the other weapons systems and other goods and services purchased by the Defense Department.
- Tell the students that two other categories of direct employment from defense spending are important. They are the active military and the civilian employees of the Department of Defense.

- For more advanced classes you may wish to introduce the concept of induced employment from defense spending. These are the job openings created when the military and civilian workers who are employees of the Defense Department and the workers employed by the Defense contractors spend their earnings in their communities, creating demand for housing, food and other goods and services.

- Tell the students that the estimated total of defense-related jobs in the U.S. economy in fiscal 1984 was 6.4 million. Note that this includes direct and indirect jobs, but not induced employment.

Developing the Lesson

- Distribute the Handout to the class and examine Table 1 with the students. It gives the **total** number of direct and indirect jobs attributable to military spending, broken down by category, for fiscal year 1984. Explain that jobs in industry are the result of spending in the private sector for such things as research and development of new weapons, procurement of weapons, and military construction.

  Ask the following questions to be sure that the students understand the data in Table 1: How many people are directly employed by the Department of Defense? (3.2 million). How many are employed in defense-related industries? (3.1 million). About what percentage of the total U.S. employment is defense rated? (6.2%).

- Ask the class to examine Table 2. Point out that Table 2 presents the jobs created by the **additional** spending of $1 billion by the federal government for the different purposes presented in the table. For example, government spending of $1 billion more for modernizing public housing will create an estimated 23,500 jobs.

  You should make clear that 23,500 is not necessarily the **net** total of the jobs created. Financing the spending by government will reduce spending elsewhere in the private sector. As a result, there may be no increase, there may even be a decrease, in job creation depending upon how the revenues are raised and spent.

- Emphasize that the data in the table is relevant to the issue of where government should spend its revenues. Students should see that some additional spending by government in one area may generate more jobs than the equivalent amount of additional spending in another area.

- Ask the students why the same amount of spending in different categories creates different increases in employment. (Some categories of workers are paid relatively low wages so that a given amount of spending will create more jobs. The average dollar of defense spending creates more jobs than a dollar spent on procurement because it includes wages of recruits, who are low paid. Day-care programs are an example of a labor-intensive, low-wage activity in the civilian sector. Public works projects use more capital equipment and materials and the workers are relatively well-paid.)

- Emphasize that these estimates are quite rough: they depend on assumptions about the mix of projects, the prevailing wage rates at the time the estimates were made and whether the local government projects are assumed to be new projects that would not have been undertaken without federal dollars. In some programs federal dollars simply substitute for local dollars in projects that would be undertaken anyway.

- Finally, point out to the students that citizens and government leaders are also concerned with who gets the jobs as well as how many are created. For example, some argue that women and minorities are under represented in skilled defense industry. Your students should realize that this argument is sometimes given as a reason for spending in areas other than national defense. Another important consideration is that alternative spending decisions will affect employment in regions of the country differently. Ask the students to consider the regional differences between shipbuilding for the Navy and equal spending for mass transit.

Concluding the Lesson

- Have the students divide into small groups to discuss and answer the questions included in the Handout.
- Return to the whole class to discuss questions 5 and 6. You might ask half of the groups to argue in favor of military spending for job creation and the others to argue against. Question 6 is an open-ended question that can introduce the trade-offs in policy decisions between competing goals such as national security and employment.

Suggestion for Additional Reading

Congressional Budget Office. Defense Spending and the Economy. 1983.

Answers to the Handout

1. 6.2%.
2. 125,000; 25,000.
3. Home Health Aides; Military Procurement.
4. Health aides are low-paid and do not use expensive capital equipment or other materials. Military procurement requires inputs of metals, and other materials as well as highly-paid skilled workers.

Impact of Military Spending and the Economy

Table 1

Defense-Related Employment, FY 1984

Categories	Employment
Active Military	2,215,000
Direct hire civilians	1,072,000
Total: Department of Defense	3,287,000
Defense-related employment in industry	3,130,000
Total: Defense Employment	6,417,000

Source: Office of Assistant, Secretary of Defense, Comptroller
Note: Total U.S. employment FY 1984 = 103,500,000

Table 2

Alternatives for Job Creation

Program	Estimate of jobs created per $1 billion
Defense	
overall	125,000
procurement only	21,000
Nondefense governmental spending (average, all programs)	25,000
Day Care Services	112,000
Home Health Aides	140,000
Public Housing Modernization	23,500
Highway and Mass Transit	34,500

Sources: CBO, Defense Spending and the Economy, 1983; Congressman Les Aspin. "Defense Spending and the Economy," April 1984.

From *Economics and National Security*. Mershon Center, The Ohio State University.

Questions

1. What percent of total employment in fiscal 1984 was defense-related?

2. How many jobs would $1 billion spent on overall defense create? What is the average number of jobs that $1 billion spent by the government will create?

3. For the same amount of spending which of the programs listed in the Handout will create the largest number of jobs? The fewest?

4. Why do you think there is such a difference between these two programs?

5. If you wanted to argue in favor of a military program, which job comparison would you make? If you wanted to argue against a military program, which comparison would you make?

6. Why do we care about the employment effects of military expenditures? What should we take into account beside the number of jobs?

Defense Spending and the Federal Budget Deficit

by Judith V. Reppy

Preview of Main Points

In this lesson students analyze two conflicting viewpoints on the question of reducing the federal deficit by cutting defense spending. Students use a six-step approach to examine two readings from opposing perspectives.

Connection to Textbooks

This lesson can be used in conjunction with textbook presentations of the federal budget process or fiscal policy.

Economic Concepts

Fiscal policy, deficits, and trade-offs.

Objectives

Students are expected to:

1. identify the main ideas in two conflicting readings;
2. apply a method for dealing with the conflicting viewpoints in these two readings; and
3. consider additional information to form an opinion about the key question in the lesson.

Suggestions for Teaching the Lesson

Opening the Lesson

- Review the meaning and nature of the federal budget deficit. Explain that among many recent proposals for reducing the deficit is one calling for reducing federal spending by cutting military spending. Tell students that in this lesson they will read pro and con viewpoints on this subject.

Developing the Lesson

- Have the students read the six recommended steps for dealing with conflicting viewpoints on the top part of Handout 1. Discuss the six steps if necessary.

- Have the students read and complete Handouts 2 and 3. Require the students to complete the questions on the bottom half of Handout 1. This may be done orally or in writing as individuals or in small groups. Point out how the questions are related to the first five of the six steps for dealing with conflicting viewpoints.

Concluding the Lesson

- Discuss the students' answers to questions 1 through 5.

- Ask the students which reading they believe made the stronger argument. The students should be able to defend their answers using information generated by answering questions 1 to 5.

- Discuss step 6 of Handout 1 as a class.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Defense Spending and the Federal Budget Deficit

Recently there has been great debate in both houses of Congress on ways to reduce the federal deficit. One proposal has been to reduce federal spending by cutting outlays for defense. This proposal has sparked controversy between supporters and opponents. Handouts 2 and 3 express some of the pro and con opinions on cutting military-related spending.

Steps for Analyzing Conflicting Viewpoints

How do you go about dealing with conflicting view-points like those expressed in Handouts 2 and 3? In this lesson you will use the six-step approach given below--a simple way of examining any issue on which there are two (or more) conflicting sides or opinions.

Step 1. Identify the issues on which both sides agree.

Step 2. Determine the issues raised by one side which were omitted by the other.

Step 3. Identify issues on which both sides disagree.

Step 4. On any point of disagreement, determine reasons for the disagreement.

Step 5. Identify any other factors that must be analyzed concerning the issue in dispute.

Step 6. Use the arguments you have analyzed to construct your own opinion on the issue.

Using the Steps

Once you have read Handouts 2 and 3 apply the above six steps for dealing with conflicting viewpoints by answering the following questions:

1. Are Handouts 2 and 3 in agreement about anything in regard to the national deficit or defense spending? If so, underline the key sentences that indicate agreement.

2. Was there any point raised in either reading that was not addressed by the other reading? If so, underline twice the key sentences that summarize the points made.

3. According to Handout 2 has defense spending increased or decreased in recent years? According to Handout 3 has defense spending increased or decreased in recent years? On what other points do Handouts 2 and 3 disagree?

4. Put a star at the beginning of all the sentences in Handout 2 that give a reason for cutting defense spending. Put a star at the beginning of all the sentences in Handout 3 that give a reason for not cutting defense spending.

5. Suppose you wanted to learn more about the impact of defense spending on the federal deficit. For what points do you need more information? Where might you look for information? What kinds of sources might you consider?

6. What is your opinion on this issue? Is reducing defense spending an effective way to reduce the federal budget deficit?

From *Economics and National Security*. Mershon Center, The Ohio State University.

Defense Spending Must be Reduced

President Reagan began his second term of office by calling for a balanced federal budget. But, the president did not ask the Pentagon to cut back on spending as part of the administration's overall effort to reduce the federal deficit. The administration claims it has already cut the military budget. The truth of the matter is that in 1986 Defense Department spending is going up, not down. The administration's plans call for $31.2 billion more to be spent on defense in 1986 than was spent in 1985. In 1986, spending by the Defense Department is expected to rise over 8 percent. Meanwhile, the administration's plans call for reductions of $65.6 billion in spending on education, health, and other social programs.

Statistics make it clear that spending on defense, not on domestic welfare, has been the culprit driving up the federal debt. For example, in 1980 the deficit was $74 billion. And how much did the Defense Department spend that year?--$131 billion. By 1986 the administration estimates the deficit will rise to $180 billion. Meanwhile, defense-related spending will skyrocket to $277.5 billion. Until defense spending is brought under control it will be impossible to reduce the deficit.

However, a great part of what the Pentagon spends is uncontrollable because it is tied to existing weapons contracts. At the end of President Carter's administration these uncontrollables made up 27.2 percent of defense spending. But in 1986 38.2 percent of defense spending will be uncontrollables. The uncontrollables are increasing because the Department of Defense has not spent all of the money appropriated by Congress in previous years. Unspent appropriations, largely for new weapons, have jumped from $92 billion in 1980 to an estimated $279.6 billion in 1986.

"Stretchouts" are another problem. The Defense Department continues to stretch out the rate at which it is buying new weapons by spreading purchases out over a number of years. This allows the Defense Department to spend less each year. But total costs go up because of inflation and inefficiencies that take place when production of weapons is stretched out.

The Defense Department claims it has cut its budget. This is because the Defense Department calculates its budget in a way no other federal agency is permitted. The Defense Department allows its officials to begin budget calculations at unrealistic, high levels known as baselines. Any spending on a level below the baselines is then called a "cut."

The Pentagon has made no cuts. In fact, defense outlays are at the highest level since the end of World War II. Not even during the Korean War and the war in Vietnam were Pentagon outlays as high as in the 1980's.

Congress will have its hands full trying to cut back defense spending in order to come up with the savings needed to reduce the federal deficit. If Congress is really serious about curbing the deficit, defense is one of the few areas that will provide the savings Congress needs.

(Adapted from "Military Spending Boosts the Deficit" by Gordon Adams and Laura Weiss in Bulletin of the Atomic Scientists, April, 1985, Vol. 41, No. 4, page 16.)

Deficit Problems Are Not Due to Defense Spending

Today, it often is said that nothing can be done about the federal budget deficit without cutting defense spending. This simply is not true. In his second term of office President Reagan has shown how the deficit can be reduced without significantly cutting defense. Despite this, there are many important people who do not want to cut the deficit without cutting defense. We must ask why that is so.

A majority of the American people have a distorted idea of the size of defense spending. In a 1984 poll only 6% of the participants quizzed responded correctly to the question "How much of the GNP (Gross National Product) is spent on defense?" Defense expenditures in 1984 were 6% of GNP. But 57% believed defense spending was over 20% and 9% believed it to be above 50%. With such mistaken ideas about the size of defense spending, some people naturally think it impossible to cut the deficit without cutting defense.

It simply is not true that the defense program today is the principal cause for the deficit. Defense expenditures in the 1980's (calculated as a percentage of the GNP) are smaller than in any year between 1951 and 1972. In the last year of a balanced federal budget--1969--defense was 9% of the nation's GNP. Compare that with 6.6% for 1985. Moreover, according to administration plans, defense expenditures by 1990 will rise to only 7.5% of GNP. Meanwhile non-defense spending by 1990 will rise to a level of 25% higher than in 1984.

Why has the defense program become the indispensable item in trying to reduce the deficit? What seems to be involved for many people is the principle of fairness. For them, if federal aid to education (etc.) is to be cut, then defense should be cut too. But defense is not for the benefit of one group in the way that aid to education is for the benefit of students. Defense is for the benefit of this and future generations of Americans. The real question of fairness is this: Is it fair to risk the security of future generations in order to increase spending on domestic welfare today?

In fact, almost no one who calls for cutting defense says he or she wants weaker forces. Almost all insist they want to get the same military protection--only more cheaply.

One suggestion for providing defense more cheaply is to stretch out the military buildup over a longer period of time. This would reduce Pentagon outlays of money in the near future. But "stretchouts" mean more expenditures later. Also, defense forces obtained later do not provide as much security as defense forces obtained earlier. Planes purchased for delivery in 1990 will not protect the country in 1989. "Stretchouts" reduce national defense.

A cut by Congress in the defense budget is going to cut strength. A cut will be the result of--or at least be justified by--misinformation about the relation of defense to the budget and the national economy.

(Adapted from "Cutting the Lean out of Defense" by Herbert Stein in Wall Street Journal, February 27, 1985, page 34.)

Where are Defense Dollars Spent?

by Terry L. Smart

Preview of Main Points

In this lesson students consider whether some regions of the U.S. receive more than a fair share of Department of Defense contracts. Students use data on defense spending and population to test two points of view given in the lesson introduction. They also are asked to consider reasons why the issue of where defense dollars are spent is an important issue in the 1980's.

Connection to Textbooks

This lesson may be used in conjunction with textbook material on fiscal policy, allocation of federal resources or economic stabilization policies.

Economic Concepts

Government spending, fiscal policy, and ratios.

Objectives

Students are expected to:

1. interpret information on defense spending from tables;
2. analyze arguments using this data; and
3. consider the implications of political decisions for defense spending on national security.

Suggestions for Teaching the Lesson

Opening the Lesson

- Display a wall map of the United States which students can use as a reference, since they may not be able to identify all the states by name.

- Explain to students the main points of the lesson. Distribute Handout 1 and have students read the opening paragraphs and look over Table 1.

Developing the Lesson

- Review Table 1 with students to make sure they understand the type of information presented in the Table.

- Distribute Handout 3 (map of the U.S.) and instruct students to use the map and Table 1 to complete the "Worksheet for Table 1."

- Distribute Handout 2. Review Table 2 with students to make sure they understand the type of information presented in the Table. Have students complete the "Worksheet for Table 2."

- When the students consider questions 16 and 17, ask about the other meaning of proportional distribution. In other words, how should defense contracting be distributed to be fairly proportional? Should each state receive an equal share of defense contracts? Or should states receive a share based on population? And what if states don't have the industry to carry on defense work? How can a contract for ship building be awarded in North Dakota? Students should consider what problems are involved in distributing defense contracts.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Concluding the Lesson

- To close the lesson discuss why the issue of where defense dollars are spent is an important issue. Ask the students if they think the vote of a member of Congress on increases or decreases in defense spending can be influenced by whether or not he or she represents a state that relies heavily on defense contracts for income and jobs.

Answers to Handout 1

1. California.
2. Wyoming.
3. California, New York, Texas, Virginia, Massachusetts, Missouri, Connecticut, Florida, Washington, Maryland, in order.
4. Responses will vary.
5. Far West $32,841; Southwest $10,049; Northeast $36,046; South $25,341; Midwest $12,482.
6. $58,182.
7. $68,231.
8. $48,528.

Answers to Handout 2

9. California, New York, Texas, Pennsylvania, Illinois, Ohio, Florida, Michigan, New Jersey, North Carolina.
10. Far West 37.8 million, Southwest 18.3 million, South 56.4 million, Northeast 75.3 million, Midwest 36.3 million.
11. 13 million.
12. 111.6 million.
13. See answers 3 and 9.
14. Answers will vary. NH: $9.634 million/17.5 million = $551/person; Connecticut: $1655; Ohio: $311.
15. S, SW, FW = $68,100 million/113 million = $603/person; NE, MW = $48,500 million/111.6 million = $435/person.

Where Are Defense Dollars Spent?

Each year the Department of Defense pays large sums of money appropriated by Congress to business firms throughout the United States. One longstanding debate about the economics of national security concerns the impact of defense spending. One aspect of this debate focuses on where defense dollars are spent.

Critics of the Department of Defense suggest that defense spending goes disproportionately to states in the South and the West. In other words, they say the Government concentrates spending in a few favored states. On the other hand, supporters of the Reagan Administration suggest that spending patterns have favored states in the Northeast and in the Midwest, not the South and West.

Where are defense dollars actually spent? One way to try to answer this question is to examine a breakdown by state of defense contracts awarded in one fiscal year. This data can be compared with information on the population of each state. This is one way to determine if defense spending is disproportionate.

Table 1 provides some information on defense contracts awarded during one year in the 1980's. Examine the table then answer the questions that follow.

Table 1

Defense Contracts Awarded by State, 1983

State	Total Contracts in Million $	State	Total Contracts in Million $
Alabama	$ 1,127	Montana	$ 116
Alaska	386	Nebraska	162
Arizona	1,359	Nevada	158
Arkansas	628	New Hampshire	540
California	26,387	New Jersey	2,639
Colorado	1,006	New Mexico	62
Connecticut	5,132	New York	9,634
Delaware	219	North Carolina	786
Florida	4,650	North Dakota	136
Georgia	2,449	Ohio	3,364
Hawaii	638	Oklahoma	611
Idaho	249	Oregon	180
Illinois	1,534	Pennsylvania	3,328
Indiana	2,117	Rhode Island	381
Iowa	406	South Carolina	399
Kansas	1,574	South Dakota	42
Kentucky	419	Tennessee	828
Louisiana	1,484	Texas	8,228
Maine	404	Utah	722
Maryland	3,539	Vermont	179
Massachusetts	6,327	Virginia	7,071
Michigan	1,782	Washington	3,985
Minnesota	1,604	West Virginia	121
Mississippi	1,840	Wisconsin	775
Missouri	5,637	Wyoming	38

Source: Defense 84, American Forces Information Service, Arlington, Virginia, 1984, p. 23.
Note: Totals include contracts of $25,000 or more that run for more than one year.

Worksheet for Table 1

1. Which state has the greatest dollar amount of defense contracts? ____________

2. Which state received the smallest dollar amount of defense contracts? ____________

3. List the top ten states:

   1. ____________
   2. ____________
   3. ____________
   4. ____________
   5. ____________
   6. ____________
   7. ____________
   8. ____________
   9. ____________
   10. ____________

4. How much in defense contracts was awarded to businesses in your state? ____________

   Examine the outline map of the United States in Handout 4. This map shows forty-eight of the fifty states. The states have been divided into regions.

5. Using the table of defense contracts and the map calculate how much was spent in each of these regions.

   Far West $ ____________ Northeast $ ____________ South $ ____________

   Southwest $ ____________ Midwest $ ____________

6. Opponents of defense spending suggest that too much is spent in the South and the West. Calculate how much was spent there.

   Far West + South = $ ____________________

7. Some consider Arizona and New Mexico to be part of the Far West, while others consider Texas part of the South. Calculate another total including these states.

   Far West + South + Southwest = $ ____________________

8. Proponents of defense spending suggest that defense spending favors the Northeast and Midwest, not the South and the West. Calculate how much was spent in the Northeast and Midwest.

   Northeast + Midwest = $ ____________________

Table 2 below lists the population of each state. Use this table and the map to answer the questions that follow.

Table 2
1980 Population by State

State	Population	State	Population
Alabama	3,893,888	Montana	786,690
Alaska	401,851	Nebraska	1,569,825
Arizona	2,718,425	Nevada	800,493
Arkansas	2,286,435	New Hampshire	920,610
California	23,667,565	New Jersey	7,364,823
Colorado	2,889,735	New Mexico	1,302,981
Connecticut	3,107,576	New York	17,558,072
Delaware	594,317	North Carolina	5,881,813
D.C.	638,432	North Dakota	652,717
Florida	9,746,324	Ohio	10,797,624
Georgia	5,463,105	Oklahoma	3,025,290
Hawaii	964,691	Oregon	2,633,149
Idaho	944,038	Pennsylvania	11,863,895
Illinois	11,426,518	Rhode Island	947,154
Indiana	5,490,260	South Carolina	3,121,833
Iowa	2,913,808	South Dakota	690,768
Kansas	2,364,236	Tennessee	4,591,120
Kentucky	3,660,257	Texas	14,229,288
Louisiana	4,206,312	Utah	1,461,037
Maine	1,125,027	Vermont	511,456
Maryland	4,216,975	Virginia	5,346,818
Massachusetts	5,737,037	Washington	4,132,180
Michigan	9,262,078	West Virginia	1,950,279
Minnesota	4,075,970	Wisconsin	4,705,521
Mississippi	2,520,638	Wyoming	469,557
Missouri	4,916,759	**TOTAL U.S.**	226,545,805

Source: Department of Commerce, Bureau of the Census

Worksheet for Table 2

9. List the top 10 states in population.

1. ____________ 4. ____________ 7. ____________ 10. ____________

2. ____________ 5. ____________ 8. ____________

3. ____________ 6. ____________ 9. ____________

10. Calculate the total population of each region.

    Far West ____________ Northeast ____________ South ____________

    Southwest ____________ Midwest ____________

11. Calculate the total population of the Far West, Southwest, and South.

    Far West + South + Southwest = ________________________

12. Calculate the total population of the Northeast and Midwest.

    Northeast + Midwest = ________________________

13. Compare your list of the top 10 states in population with the list of the top 10 states in contract dollars awarded. Are the same states listed? Is the order similar?

14. One other quick way to do a comparison is to calculate and compare some proportions or ratios. For example, the total of the contracts awarded in Table 1 is about $11 billion. The total population is about 227 million. The ratio "contract dollars per person" is $118 billion ÷ 227 million = $520 per person.

    Try calculating ratios for some of the top 10 states. Are they about equal? Are they higher, lower, or about the same as the national average.

15. Calculate the ratios for the South, Southwest, and West combined. How does it compare with the ratio for the Midwest and East combined?

16. Based on your analysis, how would you now respond to the statement "a disproportionate amount of defense spending goes to states in the South and the West." Explain.

17. Based on your analysis, how would you now respond to the statement "defense spending favors the Northeast and Midwest, not the South and the West." Explain.

18. What additional information would you need to examine in order to make a more accurate response to questions 16 and 17?

19. There are reasons why every state does not receive contracts in direct proportion to its population. The following list gives some of these reasons.

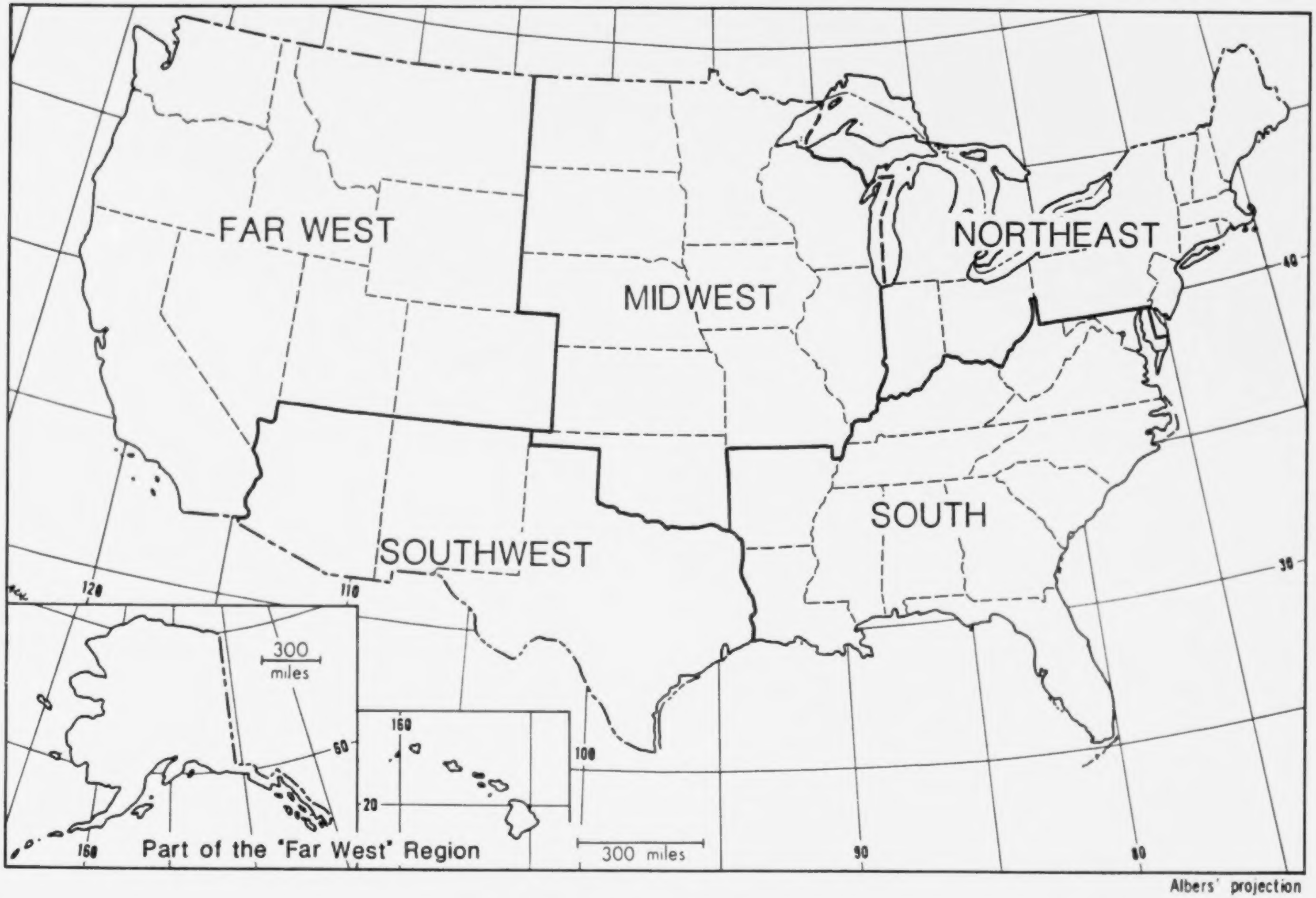
    a) The manufacture of military goods should not be concentrated in any one area due to danger of terrorism, sabotage or other attack.

    b) Members of Congress or key committees are pressured by special interests that want to shift spending to their states.

    c) Members of Congress are pressured by special interests that want to shift spending away from states having many defense contracts now.

    d) An equitable distribution should not be the only guide for defense spending. For example, we cannot build warships in North Dakota.

    What reasons can you add to this list?



From *Economics and National Security*. Mershon Center, The Ohio State University.

Is National Defense Being Overproduced?

by Steven L. Miller

Preview of Main Points

Because national defense is a public (or social) good, it is in a class of goods about which there has been much argument in economics. This lesson applies the major arguments about the determination of the proper amount of spending on a public good to the issue of whether national defense is overproduced.

Connection to Textbooks

This lesson should fit well with textbook treatments of public goods and perhaps with sections on the functions of government.

Economic Concepts

Private good, public good, costs, and benefits.

Objectives

Students are expected to:

1. identify the major characteristics of a public good and determine if national defense fits this characteristic;
2. examine and discuss the reasons why some people think national defense is overproduced and others believe it to be underproduced; and
3. reach a tentative conclusion regarding the cases as presented.

Suggestions for Teaching the Lesson

Opening the Lesson

- If students have had no formal introduction to public goods, explain the determining characteristic of a nonrival good and also the meaning of non-excludability. (See Information for Teachers.)
- Ask the students to provide some examples of goods with the first or both characteristics.
- Ask whether national defense is a public good.

Developing the Lesson

- Tell the students that they will be reading about the "trial" of National Defense. Distribute copies of the Handout. Ask them to read the first paragraph and identify the charge.
- Instruct the students to list the arguments for both the defense and prosecution.

Concluding the Lesson

- Discuss the reasons that the students have listed. Ask which arguments they thought were strong and which were weak.
- Have the students vote as the jury on whether National Defense is guilty.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Information for Teachers

The term "public good" is more common, but some authorities, notably Musgrave and Musgrave, use the term "social good."

Nonrival consumption means that one person's consumption does not prevent anyone else from consuming the same thing. National defense is the perfect example of this: One person's protection does not prevent another from being protected. Television and radio signals are another. Everyone can tune in on a signal without preventing anyone else from doing so. Nonrival consumption is the only criterion something must meet in order to be classified as a public good.

However, goods (or services) meeting the second criterion of nonexcludability are sometimes loosely treated as public goods. This is not technically correct, according to most authorities, and the distinction has some theoretical importance to economists. In the case of national defense, it meets the second criterion as well. Once national defense is provided, one cannot be excluded. Note that one could be excluded from using radio or television signals, by signal scramblers, for example. National defense meets both criteria, radio signals, only the first.

Suggestion for Additional Reading

Musgrave, Richard, and Musgrave, Peggy. "Chapter 3." Public Finance in Theory and Practice. McGraw-Hill: 1976.

This book offers an excellent treatment of the theory of social goods.

Is National Defense Being Overproduced?

National Defense is on trial in the Superior Court of Economic Theory and Practice. The charge: Spending not justified by the desire of the people for security. No matter what the outcome of this trial, National Defense will still have to face this charge in the Court of Values and Opinions with a final judgment to be rendered by the Supreme Court of the Voters. Nonetheless, analysts believe that what happens to National Defense (ND for short) in this court could influence the results elsewhere. The defense and prosecution are summarizing their cases. Let's listen in . . .

The Attorney for the Defense:

Ladies and gentlemen of the jury, the prosecution has presented no evidence showing that ND is not a **public good** desired by all, indeed needed by all. As is the case with all true public goods, as opposed to private goods, national defense clearly has the characteristic of nonrival consumption. As the jury knows well, this means that one person's partaking of ND does not reduce the defense benefits enjoyed by anyone else. National defense for some is national defense for all. Also, national defense has the characteristic of non-excludability, meaning that it provides benefits to everyone in a manner such that no one can be excluded from receiving it once it is made available. This is a characteristic of many, though not all, public goods.

Now my point, dear jurors, is to establish clearly in your minds that ND is a public good because it is well known among some in the economics profession that public goods are **underproduced**, not overproduced. This means that we spend **too little** on national defense, not too much. Consider the arguments that we have advanced.

First, remember that in a market system individuals are used to receiving the full benefits of the private goods they buy. But with public goods, the benefits are received by everyone. People forget that while others are receiving the benefits of the taxes they pay, they also are receiving the benefits of the taxes paid by others. Because individuals mistakenly think they are receiving less than the full benefits of the public good, they want to buy less of it. Thus, too little is produced.

Another reason is that people don't even realize how great are the benefits that they are receiving from ND. Most of the time the benefits of spending on private goods are obvious. And some public goods generate very visible benefits, such as paving and maintaining city streets. But ND has pretty much invisible benefits, so people don't provide it with enough support. There is simply a bias on the part of the public to spend less on the invisible benefits of government and keep more for the visible benefits of private use. No one likes to see their hard-earned dollars taxed away.

Finally, it has been argued that, unlike the billions spent on advertising to sway people into buying more private goods, little if anything is spent to encourage people to support spending for most public goods. It is an unequal contest with the real preference of the people losing because what they really want has been distorted by advertising.

And what they really want, or should want is more--not less--national defense. Ladies and gentlemen, remember that there is a heavy price to be paid by the country that is not prepared to defend itself. When it comes to national defense, better to err on the side of too much rather than too little.

Your honor, the defense rests.

Prosecuting Attorney:

Your honor and distinguished members of the jury, my friend from the defense has sought to mislead you. He would have you forget that while **some** economists have argued that public goods are underproduced, others have marshalled strong arguments showing that public goods are **overproduced**, including, and perhaps especially, ND. Remember the case the prosecution has presented.

First, the benefits of public goods are not necessarily shared equally. We all benefit from ND, but some, such as the military and the defense contractors, benefit much more. These special interests have a stronger interest in seeing that the spending for their particular programs takes place than the rest of us have in fighting the increased spending. Furthermore, the people in Congress trade votes for someone else's favored spending program in exchange for votes for their pet projects. The result--too much spending on public goods. That means more spending than is justified by the benefits. Spending for ND is a prime example.

Second, public goods purchased during periods of deficit financing by the government appear to the taxpayer to be costless. Spending goes up and up while taxes stay the same, or even decline. The costs of that deficit financing might be higher inflation, slower economic growth, and heavy burdens on future generations. But, because those costs are widely separated from social spending, more gets spent than would otherwise be the case. Thus, public goods are overproduced, including defense spending.

Third, the defense has argued that people sometimes do not understand the **benefits** of public goods. Well, some economists believe that people also do not understand all of the **costs** of that spending. This is especially true when some or all of the spending for a program is raised by indirect taxes. The illusion is that there will be some wonderful project that is being paid for by "someone else" when in fact that "someone else" is the taxpayer. Remember, for example, that taxes on businesses are ultimately paid by individuals.

In conclusion, do not be fooled by the emotional scare tactics of the defense attorney. The weight of the argument is clearly on the side of a guilty verdict. Do not let warnings about unpreparedness deceive you. The military is strong . . . too strong . . . stronger than we need.

If it please the court, the prosecution rests.

SECTION V

INTERNATIONAL ECONOMIC CONCEPTS

List of Lessons

National security by its nature occupies a place that bridges domestic and international policy, especially in the area of economics. The four lessons in this section discuss national security in the context of international economic concepts. The lessons are:

26. The Use of Economic Sanctions
27. Commerce and Alliances: Britain's Decision About Fighter Aircraft
28. Foreign Military Sales: Pros and Cons
29. National Security and International Trade

Overview for Teachers

Economics and national security are most closely related when examining international economic concepts. One of the principal functions of national security in the contemporary international environment is to promote and protect the economic interests of a nation. In the international arena, economic interests form one of the most frequent and regular forms of interaction among nations. The ability of each nation to assure its continued economic welfare therefore is inextricably linked to the state of the international security environment.

National security and international economics have a dual relationship. In the first place, the value of international economic interests to a nation's welfare makes them a high priority in determining that nation's security objectives. Nations must be prepared to defend the assets they possess. But security requirements extend further. Few nations are self-sufficient in vital resources. Because natural resources are not evenly distributed around the political divisions of the globe, nations are unavoidably dependent upon the flow of trade and commerce to provide those resources. This means protecting the means to deliver needed resources--for the United States principally by sea--and assuring the political climate that will maintain the requisite supply.

A second impact is contained in the transitivity of this relationship. In today's world, nations are not only dependent but interdependent. Other nations also need the resources that one's own nation possesses. The basis of trade and commerce is the potentially mutual advantages that will result from the exchange of goods. Along with vital resources, economic assets constitute a form of power. The value of trade and the potential to expand or contract it, provide nations with the means of leverage over the actions of other nations. Thus, access to resources and the terms of trade become linked to the international security environment as well.

Perhaps the most direct method of implementing the leverage of international economics is the imposition of economic sanctions--trade embargoes, import and export controls, outright prohibitions, and the like. Although historically this method has at best had only a marginal record of success, it nonetheless appears repeatedly as an instrument to which nations can turn short of the use of physical force to try to achieve security objectives. **Lesson 26** examines the conditions under which economic sanctions are or are not likely to prove successful to the country imposing them.

The international economic aspects of national security do not of course only affect adversaries. There are a number of issues with important economic content that relate directly to problems of security. **Lesson 27** explores just such a case by looking at the question of deciding who will gain the economic advantage of building a common weapons system that will be sold to the members of an alliance. In this instance five members of the NATO alliance--Great Britain, West Germany, France, Italy and Spain--are vying with each other to provide a fighter aircraft that will be used by all five. The aircraft chosen will also be able to compete in the export market with a fighter built in United States. At stake are both security requirements--a fighter that can perform the necessary role--and economic issues--who will build it?; is there potential for a cooperative venture?; how will the profits be shared?; and so on. The decision will turn on the priorities assigned to these requirements.

One area exists where the international economic considerations of security are straightforward--foreign military sales. In the post war period, with the three-fold expansion in the number of nation states, an expanding market has developed for military goods. Arms have thus become an important export commodity. But, as is no doubt evident, arms are an unusual commodity. For security reasons, both the recipients of exported arms and the technological capabilities of the weapons themselves must be carefully monitored. Political and military considerations are therefore of central importance. **Lesson 28** examines their role in the arms market. The United States has occupied a fairly stable position in the international arms marketplace. But in recent years the market has become more competitive with the entry of countries other than the U.S. and the Soviet Union, the major arms traders of a decade ago. While political concerns are still important, considerations that are more clearly economic have come to have a greater impact than before. And, even more broadly, this lesson addresses the whole question of arms sales in the context of international conflict.

Finally, **Lesson 29** looks at the relationship between considerations of national security and the purely economic content of international trade. The international marketplace, were it freely competitive, would operate theoretically on the action of the law of comparative advantage. But as we have already learned in the case of the domestic market, few markets are in fact truly free of constraints. The political constraints operating in international trade are understandably numerous and complex. And national security considerations appear regularly among those constraints. Nations are inclined to trade with allies and friends and reluctant to trade with adversaries. The same reasoning that may cause nations to impose economic sanctions in response to specific issues, may cause them to impose more general trade restrictions as well. Indeed, trade is often a good indicator of the state of relations between nations. When relations improve trade tends to increase; when relations are poor, trade decreases correspondingly. International economics can thus serve both as an instrument and as a barometer for the security environment of any given nation.

The Use of Economic Sanctions

by Steven L. Miller

Preview of Main Points

Economic sanctions allow countries that have sharp disagreements in the national security arena to pursue the conflict and attempt to alter the policies of the other country without resorting to military means. This lesson explores the conditions under which sanctions are most likely to be effective and the economic costs of imposing sanctions.

Connection to Textbooks

This lesson could be used in conjunction with chapters on international trade.

Economic Concepts

Trade, imports, and export markets.

Objectives

Students are expected to:

1. examine the reasons why countries employ economic sanctions in pursuing their national security interests;
2. use economic concepts to analyze the factors that make sanctions more or less effective; and
3. suggest some scenarios in which the United States might use economic sanctions.

Suggestions for Teaching the Lesson

Opening the Lesson

- It will be somewhat helpful if the students have already studied the ideas surrounding the gains from international trade, such as comparative advantage.
- Have the students read the first three paragraphs of the Handout.
- Ask the class to give examples of economic sanctions they may have read or heard about throughout history. Help the class categorize the examples of boycotts, embargoes or financial sanctions.

Developing the Lesson

- Have the students read and complete the "Sanctions Aren't Always Effective . . ." section of the Handout. Check their answers and their reasons for marking certain conditions.
- Help the students summarize the five conditions that increase the likelihood of success in imposing sanctions.

Concluding the Lesson

- Have the class finish reading the Handout. Return to the examples given earlier by the class. Ask if they think these sanctions were successful and what they think the costs to the sending country were.

- Ask the students to hypothesize about sanctions the United States might impose. You might help students focus on the following questions:

  a) What countries might be targets?

  b) What policies might the U.S. want to see these countries change?

  c) What sanctions might be used?

  d) Based on the conditions of effectiveness, are the sanctions likely to be successful?

  e) What are the costs likely to be?

Suggestions for Additional Reading

The Economist, August 3, 1985, p. 59.

This article presents an excellent summary of "Economic Sanctions Reconsidered: History and Current Policy," by Gary Clyde Huffbauer and Jeffrey Schott, Institute for International Economics. The same issue presents the opportunity for a case study by applying the study's conclusions to the case of the proposed sanctions against South Africa (pp. 12-13).

Gaddis, John L. "Conflict in the Modern Era." Essentials of National Security: A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

Also see Gaddis' section on economic sanctions in this chapter.

Answers to the Handout

Correct conditions are 1, 6, 7, 9 and 11.

The Use of Economic Sanctions

In today's world, wars carry with them the risk of nuclear confrontation and, perhaps, nuclear war. Fortunately, when countries pursue their national security interests there are methods available that stop short of using military force. Diplomacy is one such method. Economic sanctions are another. In this lesson you will learn what economic sanctions are and why they are used. You will also try to use what you know about economics to predict the circumstances under which sanctions are likely to be successful.

Economic Sanctions Are . . .

. . . the use of restrictions of trade or finance to punish another country, or to force it to change its policies, or to express extreme displeasure with its actions. Some examples of restrictions of finance include cutting off another country's foreign aid, eliminating low cost loans, and preventing the country from borrowing from banks or other major sources of credit. Restrictions of trade can be limiting exports to the offending nation as well as refusing to buy the products produced there. The sanctions can also vary in intensity or degree. For example, cutting off all trade is more severe than forbidding the export of certain items.

Nations employ sanctions for a variety of reasons. Sanctions might be intended to punish another country because of actions it had taken. More often economic pressure is applied to force the other country to change its policies--to stop doing something or to do something differently. For example, sanctions against South Africa are intended to force its government to change its policy of apartheid. Sometimes sanctions are symbolic gestures of displeasure that no one really expects will have any lasting effect.

Sanctions Aren't Always Effective . . .

. . . in getting another country to change policies, but there are some conditions that seem more likely to get the desired results. See if you can use what you know of basic economics to pick those conditions from the list that follows. Put a $ next to the statements you choose. In each case "sender" refers to the nation(s) imposing the sanctions and "target" refers to the country that is the target of the sanctions. Incidentally, there are five correct answers.

1. The target is a "friend" of the sender.
2. The sender is a small country relative to the target.
3. The target and sender have little history of trade and other financial dealings prior to the sanctions.
4. The target is not a "friend" of the sender.
5. The target has a strong economy.
6. The sender is a big country relative to the target.
7. The target and sender have a close trade relationship.
8. The sender seeks major changes in the target's policies.
9. The target has a weak economy.
10. The target and sender are about the same size.
11. The sender seeks minor changes in the target's policies.

From *Economics and National Security*. Mershon Center, The Ohio State University.

If the Goods Are Available Someplace Else . . .

. . . economic theory would predict that the sanctions are likely to be a failure. For instance, there is evidence that withholding grain from the Soviet Union by the Carter Administration because of the Soviet invasion of Afghanistan had little effect. Grain is a fungible commodity, which means that U.S. grain is pretty much like Brazilian grain. Thus, during the sanctions the Soviets simply bought from someone else, often a country that had purchased the grain from the U.S. with the idea of sending it on to the Soviet Union. There was no way for the U.S. to keep everyone else who produced grain or could buy grain from trading it to the Soviet Union.

So, it seems that some sanctions require several countries to agree to cooperate. If a commodity is readily available from other sources, most of the sources of supply must agree to support the sanctions. But consider the following conclusion from one expert source:

> Oddly, the figures show that in many instances multi-lateral [several countries] embargoes hinder rather than help. . . . The reason is not that cooperation is a bad thing, but that it has usually been reserved for over-ambitious targets. For the modest aims to which sanctions are best suited, no cooperation is needed.

The Costs of Sanctions . . .

. . . must also be taken into account. Transactions, whether financial or trade, take place because both sides expect to benefit from the deal. Remember that giving up these benefits is a real cost. For instance, if Country A refuses to purchase Country B's products, Country A might have to buy the products elsewhere at a higher cost or might have to make do with less desirable substitutes. Thus, there are real costs to imposing sanctions. Generally the more beneficial the transaction is to the country that is the sender, the higher the cost of the sanctions will be to the sender.

Why Use Sanctions . . .

. . . if they are often ineffective and impose costs on the sender? Sometimes the sender needs to satisfy internal demands to take action against a particular country for some especially objectionable action. Those arguing for sanctions often say something like: "It is wrong to conduct 'business as usual' with this country while they continue to violate the human rights of so many of their citizens." Economic sanctions can be a way to take action, even if it is ineffective, and thus satisfy the insistent demands of domestic political groups.

Most important, sanctions remain one way of expressing dissatisfaction to another country while attempting to force it to change its policies without resorting to armed conflict. In the age of nuclear weapons, it is useful to have non-military options.

Commerce and Alliances: Britain's Decision about Fighter Aircraft

by Steven L. Miller

Preview of Main Points

This is a case study of a decision that the British government must make. It requires balancing competing goals, some of which are largely economic, and determining which of several alternatives provides a better avenue to national security.

Connection to Textbooks

This lesson could be used with a section on economic decision making or economic goals.

Economic Concepts

Economic goals, decision making, exports, and competition.

Objectives

Students are expected to:

1. use a decision making procedure to solve a problem requiring the balancing of desirable goals;
2. discuss the reasons for competition among allies in the production of weapons; and
3. discuss the implications for national security of export competition in weapons among allies.

Suggestions for Teaching the Lesson

Opening the Lesson

- Have the students read Handout 1. Reinforce the steps of the decision making procedure. You might want to explain how different alternatives might meet the criteria differently and that students will have to judge which of the criteria are most important.
- Have the students examine the "Decision Chart." Give an example of how the chart might be filled in.

Developing the Lesson

- Have the students read "The Eurofighter," Handout 2.
- Ask the students for an example of one of the alternatives mentioned. Ask for an example of the criteria.
- Remind the students that they are to solve the problem from the British point of view. Let each student use the decision making procedure to solve the problem.
- As the students are working, you might want to check each one's problem statement and help those who have missed the problem.

Concluding the Lesson

- Discuss the solutions and reasoning of several students. Focus on reasons why they might have disagreed.

- Have the class vote on the various alternatives based on their solutions.

- Discuss why the cooperating countries were also competing with each other. Focus on economic incentives and their effect on the ability of countries to cooperate.

- Ask the students the following questions:

  1. Do you think the answer you chose is the best solution for national security or the best decision balancing a number of concerns (criteria)?

  2. Are these two things the same? Different? Always?

Further Discussion

- Your students might want to know how the EFA situation turned out. As of late 1985, Britain, West Germany, and Italy had agreed to produce an EFA and were working out details including that of production responsibility and weapons systems. France and Spain were unhappy with the other countries' insistence on the Harrier air superiority design. These two countries decided not to participate.

Suggestions for Additional Reading

The Economist, March 15, 1985, pp.69-70; and July 20, 1985, p.13.

For more information on the Eurofighter see these issues of The Economist which helped provide information for the student materials.

"France Rejoins NATO." The Economist, July 13, 1985, pp. 43-44.

This article cites some of the political reasons for West Germany's move toward the French position.

Kruzel, Joseph. "Arms Competition and Control." Essentials of National Security: A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

Kruzel's chapter provides some background information on arms competition and the technological drive behind weapons development.

Commerce and Alliances: Britain's Decision about Fighter Aircraft

A Decision Making Method

In this exercise you will make a tough decision that concerns a proposed new fighter aircraft for some of the countries of Western Europe. **You will make this decision from the point of view of the British.** To do that you need some information that is provided in Handout 2. You also need a method to help you clarify the problem and make up your mind about what Great Britain should do. The following decision making method should help you reach a sound decision. Record your decision on the "Decision Chart" at the end of this Handout.

Here are the steps in the decision making procedure:

1. Define the problem.
2. List alternative solutions.
3. State the criteria or goals.
4. Evaluate alternatives in terms of the criteria.
5. Make your decision.

Let's look at the decision procedure a little more closely.

(1) You must define the problem with care or else you might wind up solving the wrong problem. The article itself contains a problem statement if you look for it carefully.

(2) Alternatives are the different solutions that might be chosen to solve the problem. One of these is underlined in the article as an example, but there are several others mentioned. You might even add ideas of your own.

(3) Criteria are the measuring sticks we use to tell us whether a proposed action is a good idea. In the article the criterion of "saving money" is discussed. Saving money to use for other defense spending is one thing the British would like to achieve and thus, it is a criterion.

(4) However, each alternative must be measured against all of the criteria. Most alternatives will not meet all of the criteria. You will have to evaluate each alternative to see which one meets the most important criteria.

(5) Finally, you will make a decision.

Begin by reading the article and writing the problem statement on the top of the "Decision Chart." Next, record all of the alternatives in the first column and criteria in the top row. One way to record the evaluation of each alternative in terms of the criteria is to use **+'s**, **0's**, and **— 's**. Place a **+** in the space on the grid if an alternative meets a criterion very well and a **—** if it measures up poorly on that criterion. Use a **0** for an average rating.

From *Economics and National Security*. Mershon Center, The Ohio State University.

Decision Chart

Define the problem:

	CRITERIA					
ALTERNATIVES						

The Eurofighter

Britain, West Germany, France, Italy and Spain have been trying to agree on a fighter aircraft that would be produced and used by all five countries. In addition, the Europeans plan to sell the fighter (called the Eurofighter or EFA) to other governments and thus compete with planes sold abroad by the United States. The Europeans would like a larger share of the export market for fighters partly because it is expected to be a huge business opportunity--3100 planes costing over $60 billion in the next 20 years.

However, difficulties have arisen. There is disagreement over the kind of plane to build. The French want a ground attack bomber because they think that it would sell best to other countries over the next few decades. The West Germans want a fighter to defend against attacks from other aircraft in case of an invasion by the Soviet Union. The British think that a plane that can do both, a fighter-bomber, is needed even though it will be more expensive. So, the countries cannot agree on the final design for the plane.

The countries are also competing with each other. The British version of the plane requires heavier engines that are produced in Britain. The French version can use smaller engines that are built in France. The countries also disagree on how much of the production work will be done in each country. France originally wanted to do 46% of the work, but has lowered its demand to 31%. The British have suggested 10% for Spain, 15% for Italy, and 25% shares for each of the other three.

At one point, all countries except France seemed to have agreed with the British plan and version of the plane. However, it now appears that the Germans will side with the French for political reasons. That will leave the British with the problem of what kind of air support to acquire. The British could agree to go along with the French. Collaboration would be good for relations with France and might help to encourage the French in their movement back toward a common defense of Europe.

On the other hand, the British could give up on the partnership effort and single-handedly build the version of the planes they think they need to have. The British experts believe that the plane they want to build would be up to 20% cheaper if they built it alone compared to building the same plane in collaboration with the other countries. Saving money is particularly important because the British have other defense needs, some with a higher priority than the fighter aircraft. The "go-it-alone" possibility could result in some exports for Britain, although fewer than if the French version sells as well as expected.

Buying American planes or producing these planes under license purchased from American producers would be even cheaper. But, either of these options would mean discarding the design work done so far and giving up some of the jobs that British industries had been counting on. Furthermore, some of the jobs lost would be in the aerospace industry. This industry is one that political leaders in both France and Britain have been trying to develop.

One other suggestion has been to forget the EFA in favor of a combination of more anti-aircraft missiles and "Harrier" bomber planes. The missiles would be used to defend the skies over Europe from enemy planes and the Harriers would take up the bombing role of the EFA.

What do you think the British should do?

Information drawn from The Economist, March 15, 1985, pp. 69-70 and July 20, 1985, p. 13.

Foreign Military Sales: Pros and Cons

by Judith V. Reppy

Preview of Main Points

U.S. arms exports increased dramatically during the 1970's. This lesson presents data on U.S. arms exports and market share and asks the students to consider the arguments for and against encouraging arms sales.

Connection to Textbooks

Textbooks have chapters on international trade and usually on developing countries. This lesson relates to both topics.

Economic Concepts

Exports, market share, and tables.

Objectives

Students are expected to:

1. analyze data on U.S. arms sales; and
2. make a reasoned argument for or against encouraging arms exports.

Suggestions for Teaching the Lesson

Opening the Lesson

- Distribute the Handout to the class. Explain that this lesson is about U.S. arms exports and their effect on U.S. foreign policy and national security. Point out to the class that arms exports are regulated by the government.

- Explain that a special export license is needed and Congress can block a sale that it thinks is not in the best interests of the country. So an arms sale is not an ordinary market transaction; it is also an expression of government policy. Under the Carter Administration there was an attempt to restrain U.S. arms exports, which was reversed by the Reagan Administration.

Developing the Lesson

- Have the class read the Handout. You will probably need to help students interpret Figure 1. Ask students what percent of arms exports were made by the U.S. in 1974 (39%). By the NATO countries in 1978 (33%). By the Soviet Union in 1982 (30%).

- Point out to the class that the issue of foreign military sales is a classic example of the mingling of political and economic concerns. Ask them to consider how one should choose when goals such as economic efficiency and political stability come into conflict.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Concluding the Lesson

- Discuss the questions at the end of each section with the class as a whole. As an alternative to question 3, you could ask each student to prepare a position paper arguing for or against a policy of encouraging arms exports.

Suggestion for Additional Reading

Pierre, Andrew J. The Global Politics of Arms Sales. Princeton, NJ: Princeton Univ. Press, 1982.

There is a vast literature on foreign military sales. Pierre offers a very comprehensive book on the subject.

Foreign Military Sales: Pros and Cons

Introduction

The sale of weapons to other countries is highly controversial. On the one hand it may yield political and economic advantages for the selling country. But, it may also increase the chance of war in other parts of the world. Also, it may encourage nations to engage in arms races instead of in more productive investment. In this lesson you will use data on the arms exports of the United States to analyze arguments for and against foreign military sales.

Data on U.S. Arms Sales

The world trade in weapons expanded dramatically during the 1970's. One contributing factor was the increased income of oil exporting countries (including those in OPEC--the Organization of Petroleum Exporting Countries). Another was the increased sophistication and price of the weapons traded. Also the arms exports from some of the middle-sized exporters (such as France and West Germany) increased as did that of the Soviet Union and the United States. A new factor towards the end of the period was that for the first time some newly industrializing countries like Brazil and South Korea began to export arms.

Tables 1 and 2 and Figure 1 present data on U.S. arms exports, the principal recipients, and world market shares. It is important to understand how these data are defined, because different sources give very different figures on the world arms trade. Some sources give data on orders for weapons; others count only actual shipments. Some report values in the currency of the importing country while others convert all figures to U.S. dollars. The definition of what is counted as a military export and what as civilian also varies.

The data in this lesson are compiled by the United States Arms Control and Disarmament Agency. The definition of arms transfers includes weapons, ammunition and support equipment, but it excludes construction (for example, airfields) and services like military training. If these activities were included, the U.S. exports would be higher. The data are for deliveries of weapons and are expressed in U.S. dollars.

Table 1 shows U.S. exports of weapons from 1972-1982 in current and constant dollars. Because the constant dollar series has been corrected for inflation, it gives a better idea of the real growth in exports during the 1970's.

Figure 1 provides information about who the major exporters are. Notice that during this period the U.S. share of the world arms trade has ranged from about 40 percent to about 24 percent.

Also, you can see that in some years the U.S. was the largest exporter, in other years the Soviet Union was. NATO countries as a group export more than the Warsaw Pact countries.

Table 1

United States Arms Exports, 1972-1982

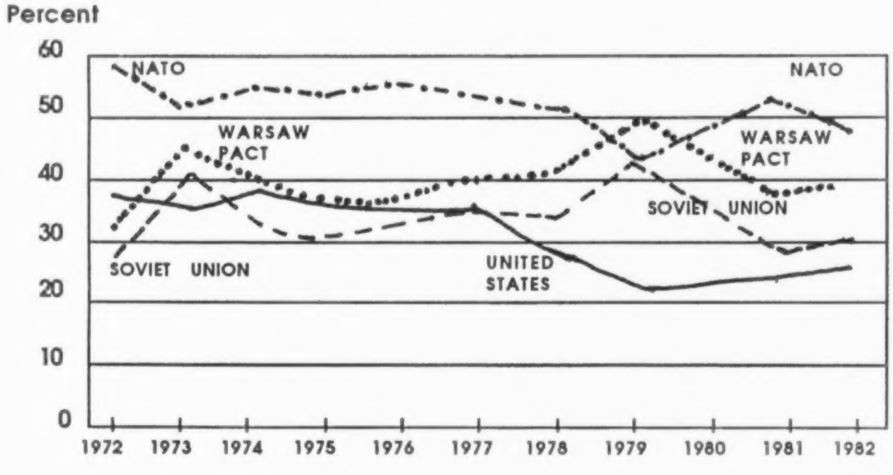
Year	Total Exports in Current Dollars (In Millions)	Total Exports in Constant 1981 Dollars (In Millions)
1972	49,783	96,840
1973	71,404	131,479
1974	98,552	166,870
1975	108,112	167,863
1976	115,413	169,546
1977	121,232	168,210
1978	143,766	185,733
1979	182,025	216,809
1980	220,786	241,384
1981	233,739	233,739
1982	212,276	200,233

Source: U.S. Arms Control and Disarmament Agency, World Military Expenditures and Arms Transfers, 1972-1982, April 1984.

Figure 1

World Market Shares

Arms Exports as a Percent of the World Arms Export Trade, 1972-1982



Source: U.S. Arms Control and Disarmament Agency, World Military Expenditures and Arms Transfers, 1972-1982, April 1984.

Who are the importers? Table 2 shows the principal importers of U.S. arms for the whole 1972-82 period. Almost two-thirds (63%) of U.S. arms exports went to developing nations; 38% went to the Middle East alone.

Table 2.

Values of U.S. Arms Exports to Various Regions; Cumulative 1978-1982

Region	Current Dollars (In Millions)
Africa	900
East Asia	7,300
NATO Europe	10,200
Other Western Europe	1,500
Latin America	650
Middle East	14,100
Canada	1,300
Oceania	1,200
South Asia	410
Total U.S. arms Exports, 1978-82	37,600[1]

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[1] (Totals may not add because of rounding.)

Source: U.S. Arms Control and Disarmament Agency, World Military Expenditures and Arms Transfers, 1972-1982, April 1984.

Pros and Cons of Selling Arms Abroad

Below is a list of claims made by those who favor encouraging arms exports. It is followed by a list of claims of those who oppose them. As you read the lists think about whether they are consistent with the data on U.S. arms sales. What other kinds of information would you need to evaluate these claims? What values are evident in the opposing arguments about foreign military sales?

Arguments in Favor of Foreign Military Sales

1. Arms exports give the United States political influence in the countries that purchase them. The countries that rely on the U.S. are more likely to think well of the United States. If the U.S. does not like something they are doing, they can threaten to stop arms shipments.

2. U.S. arms exports help to keep costs down for the Department of Defense because greater production can create economies of scale. This makes each item cheaper to produce.

3. Arms exports helps the U.S. balance of trade.

4. U.S. arms exports help to maintain the defense industrial base of the United States and so increase national security. In particular, employment in the defense industry is helped by increases in the size of the market.

5. Other nations have national security needs, and importing arms is a legitimate way to meet those needs. U.S. arms are a good buy because large scale production makes the weapons cheaper than competitive products.

6. Increased competition in arms exports means that if the U.S. refuses to sell on moral or political grounds, the country will be able to buy what it wants anyway from someone else.

Arguments Against Foreign Military Sales

1. Selling arms to other nations contributes to regional tensions and increases the probability of war.

2. U.S. arms exports too frequently involve the United States with unpopular regimes, so that the ultimate political effect for the U.S. is negative.

3. The marketing techniques used by defense contractors and the U.S. government exert undue pressure on foreign governments and encourage corruption, such as kickbacks and bribery.

4. U.S. arms exports may rob the U.S. military of needed weapons if foreign orders are filled first, as they sometimes are.

5. Developing nations, in particular, are hurt by the increase in the volume of arms transfers because they need their scarce foreign currencies for other imports.

6. As one of the two largest exporters, restraint by the U.S. would make a difference.

Questions for Discussion

1. Which claims rest largely on economic arguments?

2. Do the data for 1972-82 on market shares support the claim that if the U.S. doesn't sell someone else will?

3. A new administration has asked your advice on its policy for arms exports. What do you advise? Give your reasons.

National Security and International Trade

by Terry L. Smart

Preview of Main Points

This lesson asks students to consider that political considerations might override considerations of comparative advantage in some cases. In this lesson students analyze trade data in order to test the hypothesis that politics and national security concerns dictate international trade.

Connection to Textbooks

This lesson might easily be introduced when the chapter on international trade is taken up, or in particular when the theory of comparative advantage is explained.

Economic Concepts

Command economy, market economy, and international trade.

Objectives

Students are expected to:

1. develop some understanding of the relationship between national security concerns and international trade;
2. interpret data from tables on trade amongst Warsaw Pact and NATO nations; and
3. use trade data to draw conclusions about national security considerations and international trade.

Suggestions for Teaching the Lesson

Opening the Lesson

- If comparative economic systems have not been studied, you should explain the differences between a command economy and a market economy and the term democratic socialism. Also, the students should have some knowledge of the Warsaw Pact and the North Atlantic Treaty Organization.

- Before distributing the Handouts raise the question: "Do world affairs have anything to do with a nation's economic life?" Point out that some experts hold that politics can have a lot to do with international trade. Alert students that this lesson will consider the relation of national security concerns to world trade.

- Have the students read Handout 1. Be prepared for questions concerning (1) the invasion of Afghanistan, (2) the Korean War, (3) the improvement of U.S. relations with the People's Republic of China beginning in the 1970's, and (4) the source of U.S. hostility toward the Castro regime in Cuba since the early 1960's.

Developing the Lesson

- Have the students read Handout 2 and examine the data in the accompanying table. Explain that only six of the Warsaw Pact nations have been included to make the data easier to handle.
- As a class, answer the questions following the table. Note that the students may decide that political considerations do influence trade or they may conclude the opposite.
- Repeat the same procedure with Handout 3.

From *Economics and National Security: Supplementary Lessons for High School Courses*,
1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Concluding the Lesson

- Students should consider data from Warsaw Pact nations and NATO nations in answering the questions in the concluding exercise. Ask the students to cite evidence from the data to support their conclusions.

- To close the lesson you may wish to have a discussion on the question: "Should nations trade with friends and refuse to trade with adversaries?" Have students consider the national security implications of free trade with Communist bloc nations by which they might purchase technology from the U.S. contributing to an increase in their military power.

- Also consider the implications of restraints on trade which might contribute to hostilities between nations. For example, if the U.S. traded with Cuba would relations improve? The U.S. trades with other Communist states. Why not with Cuba? You might introduce historical examples as illustrations: for example, did U.S. refusal to trade with Japan contribute to the outbreak of war between it and Japan in 1941?

Answers to Handout 1

1. Student responses may vary. In general, students should recognize the following as the main point: Some nations of the world trade with others or refuse to trade with others largely for political reasons.

2. Examples from the reading include trade between: (a) USSR and Cuba; (b) U.S. and Cuba; (c) U.S. and China; and (d) U.S. and USSR. Encourage students to add examples not included in the reading.

3. Student responses may vary.

Answers to Handout 2

4. Bulgaria 54%, Czechoslovakia 62%, East Germany 51%, Hungary 46%, Poland 42%, Rumania 18%. Czechoslovakia sends the largest percentage of its exports to other Warsaw Pact nations; Rumania, the smallest percentage.

5. Bulgaria 60%, Czechoslovakia 62%, East Germany 50%, Hungary 41%, Poland 59%, Rumania 18%. Czechoslovakia has the greatest percentage of exports from other Warsaw Pact nations; Rumania, the smallest.

6. Bulgaria.

7. Bulgaria.

8. Student responses may vary. Students should use the answers to questions 1 and 2 to support their opinions.

9. Student responses may vary. Students should recognize the need to know more about trade with "others."

Answers to Handout 3

10. Canada 75%, Greece 42%, Italy 44%, Norway 54%, United Kingdom (Britain) 39%, West Germany 37%. Canada sends the largest percentage of exports to other NATO members; West Germany, the smallest.

11. Canada 71%, Greece 32%, Italy 35%, Norway 35%, United Kingdom (Britain) 40%, West Germany 38%. Canada has the greatest percentage of imports from other NATO members; Greece, the least.

12. Canada.

13. Canada.

14. Student responses may vary. Student should use the answers to questions 1 and 2 to support their opinions.

15. Student responses may vary. Students should recognize the need to know more about trade with "others."

Answers to Concluding Exercise

16. Student responses may vary. In forming their answers, students might compare the answers to questions 4, 5, 10, and 11 on the second and third Handouts.

17. Student responses may vary. However, students should point out that these will be economic costs to preventing otherwise beneficial trade with adversaries.

National Security and International Trade

Read the selection below, then answer the questions that follow. As you read search for the main idea.

Some nations of the world trade with others largely for political reasons. For example, the Soviet Union has traded extensively with Cuba for over twenty-five years. This is in the interest of the Soviets. They want to support a government in Cuba that is in basic agreement with the political doctrines and policies of the U.S.S.R. Soviet-Cuban trade contributes to the national security of the U.S.S.R. by helping to keep a friendly government in power in Cuba.

The reverse is also true. Nations refuse to trade with other nations because of political disagreements. The Castro government in Cuba is seen as a potential threat to U.S. national security. The United States has attempted to boycott trade with Cuba for more than twenty-five years. It is not in U.S. interests to have (a short distance off the U.S. coastline) a government hostile to American doctrines and policies.

To take another example, for decades the United States had no trade with the People's Republic of China (Communist China). In the early 1950's the United States fought against the Chinese during the war in Korea. China was seen as a threat to U.S. national security. Now, more than a generation later, the United States is moving toward a normal relationship with China. Increasing trade is a major tie between the two nations. It seems the Chinese no longer are perceived as a threat to this country's national security.

For similar reasons, Americans trade with countries in basic agreement with U.S. political doctrines and policies and restrict trade with countries in disagreement with U.S. doctrines and policies. Because of the Soviet invasion of Afghanistan in 1979, the U.S. began to reduce its trade with Soviet Russia. Even airline service between the two countries was cut off in protest of the invasion. Politics mixes with economics in shaping an international trade policy that serves a nation's national security.

Questions

1. In your own words, what is the main point in the reading above?
2. Give two examples of trade based on national security considerations.
3. Do you think the United States government should have the right to determine countries with whom Americans may trade? Explain your opinion.

From *Economics and National Security*. Mershon Center, The Ohio State University.

Trade in the Warsaw Pact

Many believe that economics and politics mix in shaping a nation's trade with other countries. In other words international trade is seen as a way to help provide national security.

But is this correct? Do countries tend to trade with one another if they have similar political doctrines and policies? And do they refuse to trade with others they consider threats to their national security? To search for an answer to these questions let's look at some data on international trade taken from a recent year.

The table below lists six nations belonging to a mutual defense alliance called the Warsaw Pact. All six have Communist governments and command economies. The Soviet Union also is a member and these six nations are considered its allies.

For each of the six countries listed you will find the names of other countries to whom it sells (exports) and from whom it buys (imports). The amount of trade is indicated as a percent of total exports and total imports. For example, 48% of Bulgaria's exports go to the U.S.S.R. while 54% of Bulgaria's imports come from the Soviet Union.

No country is listed if trade with it is less than 5% of exports or 5% of imports. If trade is under 5% the nation involved is among those indicated as "others."

Examine the data in Table 1 and use it to answer the questions below.

Questions

4. For each of the six nations listed in Table 1, calculate the percent of total exports to other members of the Warsaw Pact. Which country has the greatest percentage? The smallest?
5. For each nation calculate the percent of total imports from other members of the Warsaw Pact. Which country has the greates percentage? The smallest?
6. Which country depends most on the U.S.S.R. as a source of imports?
7. Which country depends most on the U.S.S.R. as a customer for its exports?
8. Based on information in Handout 2, do you think members of the Warsaw Pact tend to trade more among themselves than with non-members? Explain.
9. In order to make a more accurate answer to question #8, what additional information would you seek?

Table 1

Trade Among Warsaw Pact Nations

Warsaw Pact Member Nation	Trading Partner & Percent of Total Exports		Trading Partner & Percent of Total Imports	
Bulgaria	USSR	48%	USSR	54%
	East Germany	6	East Germany	6
	Others	46	West Germany	5
			Others	35
Czechoslovakia	USSR	41	USSR	46
	East Germany	9	East Germany	10
	Poland	7	Poland	6
	Hungary	5	West Germany	5
	Others	38	Others	33
East Germany	USSR	37	USSR	38
	Czechoslovakia	8	West Germany	8
	Poland	6	Czechoslovakia	7
	Others	49	Poland	5
			Others	42
Hungary	USSR	34	USSR	29
	West Germany	7	West Germany	11
	East Germany	6	East Germany	7
	Czechoslovakia	6	Czechoslovakia	5
	Others	47	Others	48
Poland	USSR	30	USSR	38
	West Germany	10	West Germany	7
	East Germany	6	East Germany	7
	Czechoslovakia	6	Czechoslovakia	5
	Others	48	Others	43
Rumania	USSR	18	USSR	18
	West Germany	7	Iran	7
	Others	75	United States	8
			West Germany	6
			Others	61

Source: The World Almanac and Book of Facts, 1987.

Trade in NATO

In Handout 2 you found data about trade among six members of the Warsaw Pact. The same kind of information is given in the table below for six of the nations who are members of the North Atlantic Treaty Organization, commonly known as NATO. This is the United States' chief mutual defense alliance.

Like the U.S., other members of NATO have non-Communist governments. Their economic systems represent a wide range, including some democratic socialist nations.

In 1987 the members of NATO were: Belgium, Canada, Denmark, France, Greece, Iceland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Turkey, United Kingdom (Britain), United States and West Germany.

Examine the data in Table 2 and use it to answer the questions that follow.

Table 2
Trade Patterns of Some NATO Nations

NATO Member Nation	Trading Partner & Percent of Total Exports		Trading Partner & Percent of Total Imports	
Canada	United States	75%	United States	71%
	Japan	5	Japan	5
	Others	20	Others	24
Greece	West Germany	19	Italy	9
	Italy	14	West Germany	16
	France	9	France	7
	Saudi Arabia	6	Others	68
	Others	52		
Italy	West Germany	16	West Germany	16
	United States	7	France	12
	France	15	United States	7
	United Kingdom	6	Others	65
	Others	56		
Norway	United Kingdom	37	Sweden	17
	West Germany	17	West Germany	16
	Sweden	9	United Kingdom	10
	Others	37	United States	9
			Others	48
United Kingdom (Britain)	United States	13	West Germany	13
	West Germany	10	United States	12
	France	8	Netherlands	8
	Netherlands	8	France	7
	Others	61	Others	60
West Germany	France	14	Netherlands	12
	Italy	8	France	11
	Netherlands	8	Italy	8
	Belgium	7	Belgium	7
	Others	63	Others	62

Source: The World Almanac and Book of Facts, 1987.

Questions

10. For each of the six NATO members listed in Table 2, calculate the percent of total exports to other members of the alliance. Which country has the greatest percentage? The smallest?

11. For each country calculate the percent of total imports from other NATO members. Which country has the greatest percentage? The smallest?

12. Which country depends most on the U.S. as a source of imports?

13. Which country depends most on the U.S. as a customer for its exports?

14. Based on information in Handout 3, do you think members of NATO tend to trade more among themselves than with non-members? Explain.

15. In order to make a more accurate answer to question #14, what additional information would you seek?

Concluding Exercise

16. Based on the data in the tables in this lesson, what do you think national security considerations have to do with international trade? Explain your answer.

17. Do you think countries should trade with "friends" and refuse to trade with adversaries? What advantages might this provide? What disadvantages? Explain your answer.

SECTION VI

ECONOMIC DECISION MAKING AND MEASUREMENT CONCEPTS

List of Lessons

The lessons in this section address a number of cases relating to making economic decisions and measuring economic outcomes. There are four lessons:

30. Defense Spending by Other Countries

31. Comparing Military Burdens:
    The NATO Alliance

32. Volunteer Army or Conscription?
    A Problem in Resource Allocation

33. Measuring Department of
    Defense Expenditures

Overview for Teachers

One of the most demanding challenge in addressing the economic issues of national security is simply knowing how to analyze the data. In areas that may appear straightforward, like the defense budget or other determinations of cost, the data are frequently puzzling and easily susceptible to distortion. There are several subject areas where economic data commonly appear in this manner--comparative defense spending, the relative burden that is carried by nations in a military alliance, the comparative costs of alternative choices available to national security decision makers, and defense expenditures as a component of the overall federal budget or the national economy as a whole. All of these raise questions of measurement.

Lesson 30 uses comparative data to examine some of the issues raised by the way in which nations approach defense spending. Nations in fact face several choices when determining how to provide for perceived security requirements. The dramatic increase in the number of nations--from 50 in 1945 to over 160 in 1985--has increased the number of nations seeking to acquire military power. The bulk of these new nations are economically less developed. Such countries either are not capable or do not choose to allocate substantial resources to the development of a defense industry. Still they exist in a world no less and perhaps more fractious than that of the superpowers. Hence, they have had to make deliberate security choices affecting their economic status. Many, following the law of comparative advantage, have sought to purchase the arms that they think that they need from those countries capable of producing them. Thus, as noted in the preceding section, an international arms market has developed to serve the interests of the consumers. Of interest is not only how the buyers--arms recipients--enter this market, but also how the sellers--arms suppliers--respond. Lesson 30 provides comparative data to examine this relationship and a framework for drawing conclusions about the international security environment from them.

A similar problem appears in the next lesson, **Lesson 31**, but from a different perspective. This lesson addresses the military burden, that is, the role that military spending plays in the society as a whole. This concept is not of course exclusively economic, for the extent of the national economy devoted to military expenditures provides a measure of the priority given to military power relative to other economic choices. The level of the military burden in any given nation may be a factor in economic deliberations by its adversaries. The United States constantly attempts to assess the relative military burden in the Soviet Union as part of the economic choices that it must make. That task is made more difficult by the inadequacy and relative impenetrability of Soviet economic data, especially when its comes to defense expenditures.

An additional aspect of observing the military burden is "burden-sharing." Burden-sharing arises in an alliance relationship where the proportionate distribution of the costs of defending the alliance is at issue. Once again comparative data on defense spending among the alliance partners is important to objective analysis of the issue. It is obvious in both cases of assessing the military burden that how one counts makes a difference in the conclusions one reaches.

The same sort of reasoning must be applied within the economies of individual nations. The perennial economic question where resources are scarce and competing interests are vying for the same dollars that will be spent on defense is: "how much is enough?" That question is difficult to answer because the assessment of relative military power upon which the answer must be based, much like comparative economic assessments, is an imprecise and uncertain process. But the answer to that question arises also within the context of the domestic economic trade-offs between alternative expenditures. That is, not only "how much is enough?," but "how best can the defense dollars that have been allocated be spent most effectively to achieve their purpose?" **Lesson 32** applies that question to the issue of conscription versus the volunteer army. The United States used conscription--the draft--to provide its military manpower through most of the twentieth century. When World War II ended the draft continued, although the U.S. was not formally at war. But the Vietnam War raised questions of social inequity and in 1973 the United States shifted to the all volunteer force to meet its manpower needs. This lesson demonstrates how one measures the economic values in choosing between these two manpower alternatives (as well as addressing some of the other values that come into play).

Lesson 33 examines how one measures military spending overall by looking at the Department of Defense portion of the United States Federal Budget. The defense budget is one of the most important sources in understanding national security in the United States. It is also often misrepresented--by proponents and opponents of defense spending alike--and is therefore one of the least understood documents. This lesson shows how different measures of defense spending can produce different conclusions. Based on the concept of "outlays" (the legal authority for the Defense Department to expend federal dollars) several approaches are considered--total current dollar outlays, total constant dollar outlays, defense spending as a percentage of all federal outlays, and defense spending as a percentage of the Gross National Product. Recognizing which of these measures is being used will provide greater objectivity in judging the merits or demerits of debates concerning the economic choices of national security.

Defense Spending by Other Countries

by Terry L. Smart

Preview of Main Points

In this lesson students use data from four tables to answer questions about arms exports, arms imports, and spending by regions and countries on weapons. Students also form hypotheses based on the data.

Connection to Textbooks

This lesson may be used in conjunction with textbook treatments of fiscal policy, world trade or the basic economic problem of scarce economic resources.

Economic Concepts

GNP, imports, exports, percentages, and tables.

Objectives

Students will be expected to:

1. read tables containing data about worldwide defense expenditures;
2. interpret the tables and create new tables using data presented; and
3. use data from the tables to hypothesize about connections between armaments sales and purchases, and threats to world peace.

Suggestions for Teaching the Lesson

Opening the Lesson

- Students will need a world map for this lesson. Before beginning the lesson examine the Handout and note the countries the students must locate. Be prepared to correctly locate these in case students have difficulty doing so.
- Distribute the Handout and review its contents. Have the students read the Handout.
- Explain to students that they are to answer the questions in the Handout by using the data in Tables 1-4.

Developing the Lesson

- Have students work alone or in small groups to answer the questions in the Handout.
- Anticipate questions regarding "industrialized" nations. In general this term is used to refer to North America, Europe, Turkey, Australia, New Zealand, Japan, and the Soviet Union. Data on the Third World does include Taiwan (Republic of China) despite that country's industrialization. The term Third World is loosely used to include Central and South America (Mexico and the Caribbean area included), North Africa, Sub-Sahara Africa, the Middle East, East Asia (Mongolia, China, North and South Korea, and South Asia (other countries of Far East excluding Japan).

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

- Reinforce the following points with the students:

  1. From the data in Table 1 students should realize that the U.S. and West European countries make up a greater share of total arms exports than does the Soviet Union alone.

  2. In Table 2 students should recognize that almost two-thirds of arms importers are non-industrial nations.

  3. As the students work with Table 4, point out that the **percentage** of GNP spent on defense does not reveal the **amount** spent. You might use the following illustration. If Guyana and Malaya both spent 7% of GNP on defense, the amounts spent would be very different--$36 million for Guyana (7% of $507 million) and $2 billion for Malaya (7% of $29 billion).

Concluding the Lesson

- Discuss the questions under "Applying What You Have Learned." These are open-ended questions. But students should refer to data in the lesson to explain their responses.

- It probably will be clear that the Middle East and North Africa are the world regions importing a large number of weapons and devoting large parts of national GNP to defense spending. Ask the students if it follows that this part of the world is a "powder keg" or threat to peace? What current events can the students apply to support their arguments for or against this hypothesis?

- Have the students note that the major exporters of arms are not located in the world area that is the major importer of arms. Discuss the following: if war erupts in a non-industrial region, the exporters will not be directly involved but can they remain uninvolved? You might also discuss what could be done to control or reduce the sale of arms by the major exporters.

Answers to the Handout

1. The U.S.S.R.
2. 44.5%.
3. Non-industrialized nations: 62.2%.
4. Middle East: 27.3%.
5. 36.5%.
6. 13.2%.
7. 7.7%.
8. 4.8%.
9. 10 of the 17 nations listed (Libya, Saudi Arabia, Iraq, Syria, Israel, South Yemen, Egypt, Morocco, Algeria, Kuwait).
10. Middle East and North Africa combined: 54.5%.

11. In Table A (Middle East and North Africa) students should list Kuwait, Saudi Arabia, Jordan, Libya, Israel, Oman, Syria, Iran, Iraq, Morocco, North Yemen, Egypt, Tunisia, and Algeria, a total of 14 nations.

12. In Table B (South and Central America) students should list Cuba, Haiti, Chile, Guyana, Argentina, Guatamala, Venezuela, Bolivia, El Salvador, Uruguay, Peru, Nicaragua, Paraguay, Ecuador, Honduras, Mexico, Panama, Colombia, Jamaica, Brazil and Costa Rica, a total of 21 nations.

13. In Table C (East and South Asia) students should list North Korea, Republic of China (Taiwan), Malaya, Burma, Pakistan, Bangladesh, Philippines, Nepal, Japan, Thailand, South Korea, India and Indonesia, a total of 13 nations.

14. In Table D (Sub-Sahara Africa) students should list Mauritania, Zimbabwe, Ethiopia, Zambia, Chad, Kenya, Sierre Leone, Uganda, Zaire, Tanzania, South Africa, Congo, Nigeria, Sudan, Liberia, Senegal, Ivory Coast, Ghana, Togo, Cameroon, Benin, Malawi and Gabon, a total of 23 nations.

15. Middle East and North Africa, 9 of 14 nations = 64.3%.

16. Middle East and North Africa, 9 of 14 nations = 64.3%.

17. South and Central America, 17 of 21 nations = 80.9%.

Defense Spending by Other Countries

Since World War II the U.S.S.R. and the United States have accounted for more than half the world's expenditures for armaments. But in recent years the Soviet and American share of spending has declined. In 1970 these two super powers accounted for approximately 56% of worldwide military expenditures. By the 1980's, however, their share had dropped to 48%.

Like the Soviet Union and the U.S., all countries must make difficult decisions about the allocation of scarce economic resources. Other countries decide how much to spend on defense based on several things including military strategy, commitment to international alliances, domestic needs, and their security position.

In the early 1980's the defense spending by America's allies including West Germany and Britain did not significantly increase. During the period from the 1970's into the 1980's defense spending by Saudi Arabia, Israel, the Persian Gulf states, and other countries in the Middle East and North Africa increased dramatically. These sharp increases in a relatively brief period of time reflected a growing perception of the threat of war in this region.

In this lesson you will examine data about defense spending in other countries. Study Tables 1-4 and then use information in the Tables to answer questions that follow. You will use this data to form some opinions about the relationship of trade and spending on arms to possible threats to peace.

Data on Defense Spending

Table 1

Major Exporters of Weapons

Country	Percentage share of world exports of weapons
U.S.S.R.	36.5%
United States	33.6
France	9.7
Italy	4.3
Britain	3.6
West Germany	3.0
Third World nations	3.0
Other nations	6.9

Source: Ben Crow, Alan Thomas, et al, Third World Atlas, Open University Press, Milton Keynes, U.K., and Philadelphia, 1984, pages 64-65.

Table 2

World Imports of Weapons by Regions

Region	Percentage of share of world imports of weapons
Industrialized countries	37.8%
Middle East (West Asia)	27.3
North Africa	9.2
East Asia	8.3
South America	6.2
South Asia	4.9
Sub-Sahara Africa	4.8
Central America	1.5

Source: Ben Crow, Alan Thomas, et al, Third World Atlas, Open University Press, Milton Keynes, U.K. and Philadelphia, 1984, pages 64-65.

Table 3

Major Third World Importers of Weapons

Country	Percentage shares of third world imports of weapons
1. Libya	9.0%
2. Saudi Arabia	8.9
3. Iraq	7.7
4. Syria	7.3
5. Israel	6.8
6. India	5.1
7. South Yemen	3.9
8. Egypt	3.9
9. Vietnam	3.7
10. Morocco	2.8
11. Peru	2.7
12. Algeria	2.6
13. South Korea	2.5
14. Argentina	2.2
15. Indonesia	2.0
16. Cuba	1.7
17. Thailand	1.6
18. Chile	1.6
19. Kuwait	1.6
20. Republic of China (Taiwan)	1.5
21. Other Countries	20.9

Source: Ben Crow, Alan Thomas, et al, Third World Atlas, Open University Press, Milton Keynes, U.K. and Philadelphia, 1984, pages 64-65.

Table 4
Percent of GNP Devoted to Military Expenditures

Some countries with less than 1% of GNP spent for military expenditures

Mexico
Panama
Brazil
Costa Rica
Colombia
Jamaica
Japan

From 1% to 4%

Argentina
Bangladesh
Tunisia
Guatamala
Philippines
Venezuela
Kenya
Senegal
Gabon
Nepal
Bolivia
Sierre Leone
El Salvador
Thailand
Uruguay
Uganda
Ivory Coast
Malawi
Peru
Zaire
South Africa
Nicaragua
South Korea
Algeria
Nigeria
Ghana
Togo
Paraguay
India
Ecuador
Honduras
Indonesia
Sudan
Liberia
Cameroon
Benin

From 4% to 7%

Malaya
Morocco
Chile
Burma
Chad
Tanzania
Pakistan
Congo
Guyana
North Yemen
Egypt

From 7% to 10%

Cuba
Republic of China (Taiwan)
Haiti
Ethiopia
Zambia

From 10% to 20%

Mauritania
Saudi Arabia
Jordan
Libya
Israel
Oman
Zimbabwe
North Korea
Syria
Iran
Iraq
Kuwait

Source: Ben Crow, Alan Thomas, et al, Third World Atlas, Open University Press, Milton Keynes, U.K. and Philadelphia, 1984, pages 64-65.

Questions About Table 1

1. What country is the leading exporter of weapons?

2. Italy, Britain and West Germany are active partners with the United States in a military alliance known as NATO. What share of the world's total weapons exports do these four countries account for?

Questions About Table 2

3. Which is larger: the share of total weapons imported by industrial or non-industrial nations?

4. Outside the industrialized world, which world region is the largest importer of weapons?

5. What share of total imports do the Middle Eastern and North African nations combined account for?

6. What share do East Asia and South Asia combined account for?

7. What share do South America and Central America combined account for?

8. What share do nations south of the Sahara Desert account for?

Questions About Table 3

9. How many of the leading Third World importers of weapons are located in the Middle East or North Africa?

10. What share of total Third World imports do major importers in the Middle East and North Africa account for?

Questions About Table 4

11. Make a table of your own. Label it Table A. In it list the countries from Table 4 located in the Middle East and North Africa. Arrange these countries by percentage of GNP spent on weapons.

12. Make another table. Label it Table B. Include in it the countries of East and South Asia. Arrange these countries by percentage of GNP spent on weapons.

13. Make a Table C to include the countries of South and Central America. Arrange these countries by percentage of GNP spent on weapons.

14. Make a Table D to include the countries of Sub-Sahara Africa. Arrange these countries by percentage of GNP spent on weapons.

15. Examine the tables you have created. In which of the four world areas do the largest percentage of nations spend 10% or more of their GNP on weapons?

16. In which of the four world areas do the largest percentage of nations spend 7% or more of their GNP on weapons?

17. In which of the four world areas do the largest percentage of nations spend 4% or less of their GNP on weapons?

Applying What You Have Learned

18. Based on what you have learned in this lesson, what part of the world do you think is most likely to be a threat to peace? Explain the reasons for your opinion.

19. In your opinion, what does the purchase of arms have to do with the likelihood of war or peace?

20. In your opinion, are those areas of the world where the trade in arms is relatively small more likely to enjoy peace than other areas? Explain.

Comparing Military Burdens: The NATO Alliance

by Judith V. Reppy

Preview of Main Points

This lesson introduces the concept of measuring the economic burden of military spending for the purpose of making international comparisons. Data for the NATO alliance are presented and the question of "fair shares" is discussed. There is a separate section on comparing the United States and Soviet Union, which could be omitted in a less advanced class.

Connection to Textbooks

Textbooks discuss international differences in connection with trade and developing nations. This lesson introduces these differences in a new context through comparisons of spending for military forces.

Economic Concepts

GNP, planned economies, opportunity cost, ratios, and equity.

Objectives

Students are expected to:

1. define the economic burden of military spending or the military burden as the ratio of military expenditure to gross national product (ME/GNP);
2. understand why the military burden is a useful measure for international comparisons; and
3. compare the military spending of NATO countries in terms of their military burden.

Suggestions for Teaching the Lesson

Opening the Lesson

- Distribute Handout 1 to the class. Explain that the lesson is about making international comparisons of military spending, a task that involves both technical problems and value judgments.

Developing the Lesson

- Have the class read "Measuring the Military Burden" in Handout 1 and complete questions 1, 2 and 3. Make sure that they understand how ME/GNP is calculated and how the value of the ratio changes with changes in military budgets or in GNP.

- Have the students read the next section, "International Comparisons." This section introduces some of the technical difficulties involved and the idea of using an objective measure as a test for fairness or equity in an alliance. Have the class answer questions 4, 5 and 6.

- After the class has answered the questions, you may want to lead a discussion of the appropriateness of ME/GNP as a measure of fairness. Some would argue, for example, that other considerations, such as levels of unemployment in a country or contributions that do not appear in the defense budget, should also be considered in judging fairness. You may point out that the United States has other military and strategic interests, so that not all of its military spending is for NATO (the same is true for some of the other NATO members as well).

From *Economics and National Security: Supplementary Lessons for High School Courses*,
1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

Concluding the Lesson

o Have the class read "Interpreting the Measure of Military Burden" and answer the questions together. Ask students to comment on the following statement: "There is no single, universally accepted formula for calculating each country's 'fair share' in an alliance."

Further Discussion

Handout 2 on comparisons with the Soviet Union introduces the index number problem, which arises in all international comparisons as well as comparisons over time. This section might be too advanced for some students. The two articles by F. Holzman listed at the end of the lesson plan could be assigned to advanced students; they are the best discussions of the index number problem in the context of comparing military spending across countries.

The students should be told that U.S. government estimates of Soviet military spending are controversial. There is a large margin of error, which is unavoidable given the lack of official data and the technical problems of making international comparisons.

Suggestions for Additional Reading

Department of Defense. "Report on Allied Contributions to the Common Defense." Annual.

This report is issued annually. It discusses a number of different measures of the military burden.

Holzman, Franklin. "Are the Soviets Really Outspending the U.S. on Defense." International Security, Spring 1980; and

Holzman, Franklin. "Assessing Soviet Military Spending." International Security, Spring 1982.

The above two articles by Holzman discuss estimating Soviet defense spending.

Answers to Handout 1

1. ME/GNP.
2. percentages.
3. increases.
4. Greece and the United States.
5. Luxembourg.
6. Country rankings would be different than with ME/GNP. Countries with large armies relative to population would appear to be contributing more than countries that spend more on equipment. Countries with conscription would rank higher on the manpower scale than on the spending scale.
7. Only that they are making equal sacrifices based on ability to pay.

Answers to Handout 2

8. Individual components of Soviet military spending are estimated and summed to reach a total figure.
9. Lack of complete official data because of Soviet secrecy.
10. Different relative price structures are associated with different quantities (index number problem).

Comparing Military Burdens: The NATO Alliance

Maintaining armed forces costs money and uses up economic resources. It imposes an opportunity cost on the economy in that the resources could be employed productively elsewhere. This cost to the economy is labeled the economic burden of military spending or **military burden**, for short. Measures of the burden of military spending are often used to compare military spending between countries. In this lesson you will learn how one common measure of the military burden is defined and you will see how the military contribution of NATO countries is compared using this measure.

Measuring the Military Burden

The most common measure of the military burden is the ratio between military spending (ME) and gross national product (GNP), or ME/GNP. This ratio tells you what fraction of a country's production is allocated to its national defense. It is usually expressed as a percent. For the United States in recent years, ME/GNP has been about 6 to 7 percent.

The military burden is different at different times. It goes up during wartime, when the whole national effort is devoted to winning the war. During World War II, ME/GNP reached nearly 40 percent in the U.S. This means that close to half of the national output was being used directly for fighting the war. In peacetime, the level should, logically, be much lower. After 1968, the height of spending for the Vietnam War, ME/GNP declined steadily, reaching a low of 5 percent in 1978 and 1979. Since then the ratio has been rising, but it is still low compared to much of the period since World War II. U.S. defense budgets are many times larger now than in earlier years, but GNP has grown even more, so the burden of military spending is smaller.

Test Your Understanding

1. The military burden can be measured by: ______________________________.

2. This measure is expressed in: a) dollars b) rubles c) percentages.

3. If military spending increases by 10% and GNP increases by 5%, does the military burden increase or decrease?

International Comparisons

Measures of military burden are often used in international comparisons. Members of military alliances like the North Atlantic Treaty Organization (NATO) want to know if all of the members are contributing their "fair" share. This notion of fairness in burden sharing is based on the idea that all the members of the alliance should contribute equally according to their ability to pay.

Nations also are interested in how large a burden their rivals have, since the size of their rival's military burden is a measure of the country's willingness to spend for defense. It is also a rough indicator of the country's capacity for further increases in military spending. If ME/GNP is already very high, it may be difficult for a country to increase defense spending any further.

ME/GNP is a convenient measure because it can be calculated from data that are usually available. There is no need to convert the spending figures into foreign currencies, as there is in making direct comparisons of defense budgets. For example, if we wanted to compare the size of the U.S. and French military budgets directly, we would have to convert the U.S. figure to French francs or the French figure to U.S. dollars. The figures for the military burdens are not expressed in francs or dollars because they are ratios.

Table 1 shows the size of the military burden for a number of NATO countries. Note that some of the smaller countries have large burdens. This is because the value of the ratio depends on both the numerator and the denominator. A country might spend much less than the United States on defense and still have a heavy military burden relative to its productive capacity. Greece, for example, spends roughly 7 percent of its GNP on defense.

Table 1

Military Burden (ME/GNP) for NATO Countries

Countries	ME/GNP
Belgium	3.4%
Canada	2.2
Denmark	2.6
France	4.2
West Germany	3.4
Greece	6.9
Italy	2.6
Luxembourg	1.0
Netherlands	3.3
Norway	3.1
Portugal	3.7
Spain	2.1
Turkey	5.2
United Kingdom	5.1
United States	6.4

Source: U.S. Arms Control and Disarmament Agency, data are for 1982.

Test Your Understanding

4. Which two countries in NATO have the highest military burden as measured by ME/GNP?
5. Which country has the smallest military burden?

Interpreting the Measure of Military Burden

The measure of the military burden that has been presented in this lesson, ME/GNP, measures the cost to an economy of the resources allocated to national defense. ME/GNP is essentially a measure of pain--how much of its resources a country is giving up to support its military forces--not a measure of military effectiveness. It does not measure how strong a nation's military forces are or, in an alliance, how much a country is contributing to the joint defense. For example, a country with a low GNP may have a large military burden, even though its military spending is small and contributes relatively little to the alliance total. A country that spends little, but has a strategic location, may be important to the security of the alliance, even though its economic contribution is not large.

Test Your Understanding

6. A different measure of the military burden might be the ratio of the size of the armed forces to the labor force. What would be the implication of using this measure instead of ME/GNP?
7. Turkey and the United Kingdom have almost identical military burdens. Knowing this, what can you say about their armed forces and their economies?

Comparison with the Soviet Union

Comparing the U.S. and Soviet military burdens poses special problems. The Soviet Union does not report details of its military budget, and the single number for military spending that appears in the state budget does not include all of its spending. Furthermore, because the Soviet Union has a planned economy with prices set by the central government, the official figure for military spending does not represent a true market value for the part of military spending that is reported. For example, Soviet soldiers are drafted, and are paid a very low wage. Thus, the cost of manpower in the large Soviet army is understated. (This is also true for other countries that have conscription and do not pay a market wage to their draftees.)

Because of the lack of reliable, complete Soviet data on military spending, the United States government prepares its own estimates, using a method called the "building block" approach. The cost of different military activities and forces of the Soviet Union is estimated separately, using U.S. prices for similar equipment and forces. For example, a Soviet tank is valued at what it would cost to produce a similar tank in the United States. This dollar figure is multiplied by the number of Soviet tanks produced during the year. The sum of these estimates or building blocks is the cost of Soviet military activities in U.S. dollars and U.S. prices.

But the Soviet Union spends rubles, not dollars, and uses its own prices, not U.S. prices. Measurements using U.S. prices overstate Soviet military spending because the mix of forces chosen depends partly on relative prices. If the Soviet government had to pay U.S. wages to its soldiers, it would probably choose to have a smaller army. Valuing the large Soviet army at the high wages paid to U.S. soldiers gives an exaggerated figure in dollars for the cost of the Soviet army. This problem exists to some extent whenever international comparisons are made. In general, when the mix of products and prices differs between two countries, the cost of country A's products will be higher if valued in country B's prices, and vice versa.

To estimate the Soviet military burden a ruble estimate of Soviet military spending is needed. The CIA makes a separate estimate based on the building blocks, using ruble prices whenever they are known. For some parts of the Soviet program, however, ruble prices are not known, and so the U.S. prices are used and converted to rubles by a ruble/dollar exchange rate. The burden of military spending in the Soviet Union calculated by comparing the estimate of military spending in rubles to Soviet GNP is 13-15 percent. Thus, the Soviet burden of military spending is about twice as large as in the United States, partly because they spend more than the United States and partly because their GNP is smaller.

Test Your Understanding

8. What is the building block method of estimating Soviet military spending?

9. Why is it necessary?

10. Why are U.S. prices inappropriate for estimating spending in another country?

From *Economics and National Security*. Mershon Center, The Ohio State University.

Volunteer Army or Conscription? A Problem in Resource Allocation

by Judith V. Reppy

Preview of Main Points

This lesson poses a stark contrast between market and non-market approaches to a problem in resource allocation. It gives some information about the costs and benefits associated with an all-volunteer army and a conscripted army and asks the students to identify the value judgments involved in choosing between the two approaches to meeting the Army's need for military manpower.

Connection to Textbooks

This lesson can be used with chapters on markets to illustrate the characteristics of market solutions and as an example of the way in which economic efficiency may come into conflict with other goals.

Economic Concepts

Markets, equity, opportunity costs, and trade-offs among goals.

Objectives

Students are expected to:

1. apply the concepts of opportunity cost, economic efficiency and equity to the problem of allocating labor to the military services; and
2. recognize that the choice between a volunteer army and conscription depends on basic value judgments.

Suggestions for Teaching the Lesson

Opening the Lesson

o Write the following definitions on the chalkboard: **conscription**--compulsory enrollment in the military; **volunteer**--to enter service of one's own free will.

o Explain to the class that this lesson is about comparing two different solutions to the problems of providing manpower to the armed forces. Distribute the Handout to the class. Ask the students to read the Handout. Go over the features of the system of conscription with a lottery and a voluntary system to make sure they understand how each system works.

Developing the Lesson

o Either individually or working together as a class, ask the students to make a list of the goals that a system for raising an army needs to meet (see the questions at the end of the Handout). The list should include at least the following goals: assuring an adequate flow of enlistees to the military; economic efficiency; equity; low cost to the budget; and a military force that is representative of the society. They may think of others.

o Have the students individually order this list according to their own priorities. Then ask them which system--conscription with a lottery or voluntary--is best for each goal on their list.

From *Economics and National Security: Supplementary Lessons for High School Courses*, 1987. Mershon Center, The Ohio State University, Columbus, OH 43201.

- Tell the class they are about to vote on whether they think the United States should have a draft or a voluntary system for providing the military with the manpower that is needed. Ask several students to reveal which way they plan to vote and why. The students should be able to defend their choice in a manner that is consistent with their own priorities among the goals that they have listed. Poll the class and tally the votes.

Concluding the Lesson

- Tell the class to assume the U.S. has to fight a war and ask them to reconsider their votes. Ask the students if anyone plans to change his or her vote. Select several of these students to explain why they changed their votes. Poll the class again.

Suggestion for Additional Reading

Lovell, John P. "The Military and Society." Essentials of National Security : A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

This chapter has a good discussion of the issues raised in this lesson.

Volunteer Army or Conscription?: A Problem in Resource Allocation

Throughout most of its history, the United States did not maintain a large standing army in peacetime. Since the Korean War, however, it has done so; the total number of active duty military has not dropped below two million since 1951. Until 1973 a military draft provided the men needed annually to maintain the army's size, but in that year the draft was ended and an all-volunteer force introduced. In this lesson the pros and cons of these two systems of raising an army are discussed. You will analyze the two systems in terms of their basic characteristics and the values that are at stake.

Conscription (the Draft)

In a system of conscription, or draft, the government uses its power of coercion to compel a part of the population to serve in the military. In peacetime the number of soldiers needed is not so great, so only a fraction of those eligible for service is called. Who is called may be determined by a lottery or by some other system. Some people might be exempt for reasons such as being in college or holding important jobs. Most European countries have some form of conscription.

From the point of view of economics, a military draft is not economically efficient. Coercion replaces the market in deciding who will serve. In a lottery everyone has an equal chance of being chosen. There is no match between job requirements and the level of skills and education of those drafted. The match will be somewhat better with a system that exempts some people. However, many will believe this system to be less fair because it requires some, but not all to serve. Either method is unfair to those drafted, but at least in a lottery everyone has the same chance of not being chosen.

In practice, conscription usually means that soldiers are paid less than they would be in a voluntary force. In fact one of the attractions of a draft is that it saves money in the defense budget. However, if soldiers are paid less than they could earn elsewhere, then the opportunity cost (the value of the soldiers' labor in the best alternative use) is higher than the budgetary cost. The extra cost is, in effect, a hidden tax on the draftees, who are forced to accept a lower rate of pay in the Army than they could earn in civilian jobs.

Volunteer Army

A volunteer force does not have the disadvantages of inefficiency and coercion that the draft has. Theoretically each person who volunteers for the Army is choosing the best employment open to him or her. If a better paying job were offered, it could be chosen instead. Thus there are no hidden costs of inefficient allocation of labor or hidden taxes on the volunteers: the real costs and the budgetary costs are the same.

Instead, there is a problem of paying for the volunteer force, since military pay must be increased to attract enough recruits. The increased cost of manpower may force the Defense Department to neglect other areas that are important for national security. Or, if the defense budget is increased, other governmental programs may have to be reduced to pay for the volunteer army.

A related problem in times of economic prosperity is that it may not be possible to attract the needed number of recruits to military service. Although in principle it should be possible to do so by raising pay high enough, in practice the amount of money involved may be prohibitive.

From *Economics and National Security*. Mershon Center, The Ohio State University.

Other Values

Efficiency and budget constraints are not the only values at stake. The question of equity or fairness has already been mentioned: any system that forces some to serve against their will is unfair. Even universal conscription for all young men and women would not be completely fair, because other age groups would not have to serve. Furthermore, universal conscription in peacetime would be both inefficient and costly in the budgetary sense, because it would produce many more soldiers than were needed.

However, military service is a way of fulfilling a citizen's responsibility to his or her country. Universal military service in which everyone served could be a way of providing civic training.

There are still other considerations. Many would argue that especially in a democracy, the military should be representative of the population in order to avoid creating a separate military culture. An all-volunteer force will not be representative, because military jobs and living conditions will not be as attractive to better educated persons as to those who have fewer alternatives. A conscription system with deferment will also produce an unrepresentative army.

Questions for Discussion

1. Make a list of the goals that need to be met by any system for raising an army.
2. Which of these goals are most important? Rewrite your list in order of the importance that you attach to the goals.
3. Which goals are met better by a system of conscription with a lottery? Which goals are met better by a volunteer system?
4. Which system, conscription or all-volunteer force, do you think is best? Why?

Measuring Department of Defense Expenditures

by Terry L. Smart

Preview of Main Points

This lesson shows students four ways to measure the expenditures of the Department of Defense since 1955: (1) total dollar outlays; (2) total outlays in "constant dollars" adjusted for inflation; (3) defense spending as a percent of total federal outlays; and (4) defense spending as a percent of the GNP. Students interpret data from graphs, answer questions, and reach a conclusion about the trend of defense spending based on the data.

Connection to Textbooks

This lesson may be used as a skill development lesson when textbooks introduce students to graphs. This lesson may also be introduced when the class takes up federal fiscal policy or inflation.

Economic Concepts

Graphs, inflation, percentages, constant dollars, and GNP.

Objectives

Students are expected to:

1. define four ways economists measure defense spending;
2. consider how different measures of defense spending could lead to different conclusions about trends in such spending;
3. analyze data from line graphs on defense spending by answering related questions; and
4. form generalizations about trends in defense spending by applying information drawn from data in line graphs.

Suggestions for Teaching the Lesson

Opening the Lesson

- Distribute Handouts 1, 2, 3, 4 and 5. Have the students read the introduction (Handout 1). You might want to mention that outlays, not spending authority, are used throughout the Handouts (see the first paragraph of Handout 2).
- To introduce Handout 2 you may want to reproduce this graph on a transparency to be sure that students can interpret this graph and review graphs in general.
- Have the students work alone or in pairs to answer the questions accompanying each of the four Handouts (Handouts 2, 3, 4, and 5).

Developing the Lesson

- As each Handout is completed you may check the students' answers or have them share responses with the class. When students answer the final question on each Handout their response should indicate that defense spending in recent years has been either rising, falling or staying level. These three descriptors are given in Handout 2 but not in the other three Handouts.
- Have students make comparisons as they work through the Handouts. The first two present extremely different dollar amounts. Make certain the class sees how inflation distorts the dollar outlays.

Concluding the Lesson

- After the four Handouts are completed call upon students for a brief summary of the four ways defense spending can be measured.

  Note: Be aware with regard to defense outlays as a percentage of total federal outlays that some of the decrease is explained by a shift in federal accounting in the 1960's that removed certain expenditures that were not part of the active military force from defense outlays (such as military retirement and veterans' benefits). Some analyses put these expenditures back into the defense sector (and a few also include the defense portion of payment on the national debt in this category as well). Conclusions about overall trends are not significantly altered by these changes.

- Ask the class to suggest reasons for the variation in defense spending from one time period to another. List and discuss the different reasons presented.

- Ask if there is data to support the claim that defense spending is at an all-time high; that defense spending has been increasing in recent years; that defense spending is lower today than in previous years; that defense spending has been decreasing in recent years. Students should give reasons for answers and use appropriate graphs as evidence.

Additional Concluding Exercise

- Have students write a brief essay which draws together the information gathered from their examination of the four ways to measure defense spending. Instruct students to use data from the graphs in an essay which responds to these two questions:

  1. What has been the trend in defense spending in recent years?
  2. What has been the trend in defense spending over the last 30 years?

Suggestion for Additional Reading

Brady, Linda P. "The Economics of National Security." Essentials of National Security: A Conceptual Guidebook for Teachers. Edited by J. Harf, W. Kincade and B. Trout. Columbus, OH: The Mershon Center, 1988.

See Brady for more explanation of the graphs in this lesson and defense budgets in general. The data in the graphs in Handouts 2, 3, 4 and 5 are taken from this chapter.

Answers to Handout 1

1. 1955, about $35 billion.
1965, about $50 billion.
1975, about $80 billion.
1985, about $300 billion.

2. rising; rising.

Answers to Handout 3

3. 1955, about $190 billion.
1965, about $190 billion.
1975, about $170 billion.
1985, about $270 billion.

4. rising; rising.

Answers to Handout 4

5. 1955, about 57%.
1965, about 40%.
1975, about 23%.
1985, about 28%.

6. 1955.

7. 1979.

8. falling; rising.

Answers to Handout 5

9. 1955, about 9%.
1965, about 7%.
1975, about 6%.
1985, about 7%.

10. 1969.

11. 1979.

12. falling, rising.

Measuring Department of Defense Expenditures

The cost of national defense is likely to be a major political issue throughout the 1980's and 1990's. In Congressional debates over this issue opponents of defense-related spending have argued that in recent years military expenditures have increased too much and have reached all-time highs. Proponents of defense spending say that not enough has been devoted to national security and that Department of Defense (DoD) expenditures are lower than in previous years.

Opponents and proponents of defense spending support their arguments with economic data, but they reach very different conclusions. How is this possible?

Part of the answer may be found in the way economists compare how much is spent by the Department of Defense (DoD) from year to year. This lesson will show you four methods for doing this. Then you can determine if defense spending is higher, lower, or about the same as in recent years. The four methods are:

1. **Total outlays in current dollars.** This is the total dollars spent by DoD in a given fiscal year.

2. **Total outlays in constant dollars.** This is the total spent by DoD in a given year measured in dollars adjusted for inflation.

3. **Percentage of Federal Outlays.** This measure is the percentage of all federal or national government outlays that go to defense in a given year.

4. **Percentage of Gross National Product (GNP).** This is a measure of what portion of the GNP goes to defense in a given year.

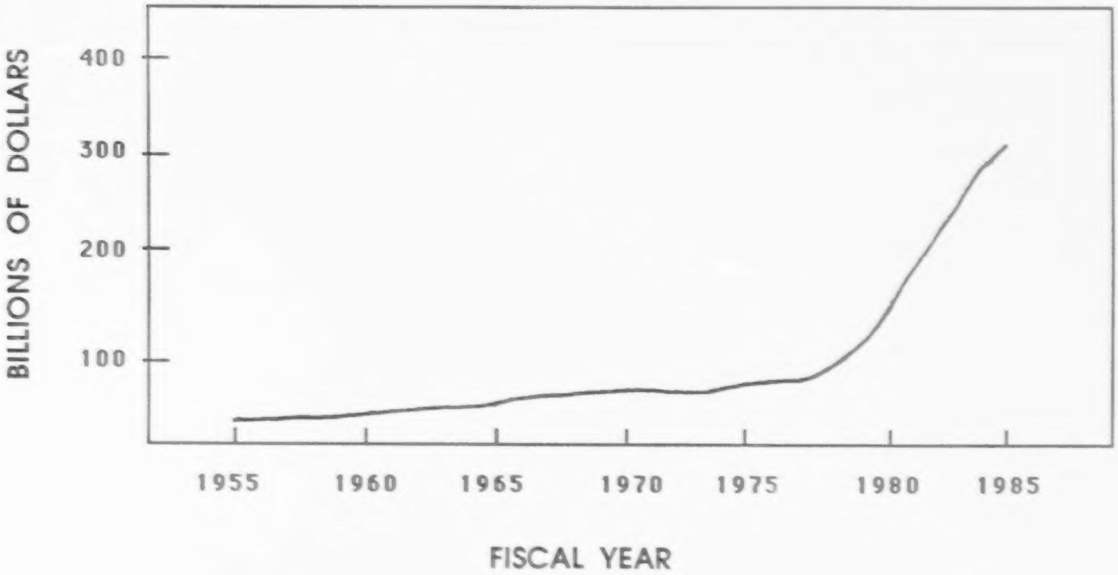
Each of the handouts with this lesson (Handouts 2-5) briefly explains one of those methods for measuring the DoD's expenditures. Read each Handout, examine the graphs, and then answer the accompanying questions.

From *Economics and National Security*. Mershon Center, The Ohio State University.

Total Outlays in Current Dollars

One way economists might look at defense spending is by calculating the total dollars spent by the DoD in a particular fiscal year. Congress has given the Department of Defense legal authority to spend money. DoD spends the money by awarding contracts, by placing orders for purchases, and by acquiring goods and paying for services. However, the DoD might not spend all of the money Congress has authorized for the year. This happens for several reasons. One is that contractors might not complete the work during the year, so they receive payment later. This graph shows the "outlays" for defense spending, not the amount Congress authorized. Outlays by the DoD are actual payments made in any particular fiscal year. The graph below presents the total amounts spent by the Department of Defense in selected years since 1955. Note that the graph shows outlays in "current dollars." This means the amount actually spend in a particular year without correcting for changes in prices from year to year.

DoD Outlays in Current Dollars, 1955-85



Questions

1. What was the total amount spent by the DoD in each of these years?

1955 $ ______ 1965 $ ______ 1975 $ ______ 1985 $ ______

2. DoD outlays for national security may be described as (a) rising; (b) falling; (c) staying level. Based on the actual dollars spent by the Department of Defense, how would you describe the trend in defense spending over the past 30 years?

______________________. In the last five years? ____________.

From *Economics and National Security*. Mershon Center, The Ohio State University.

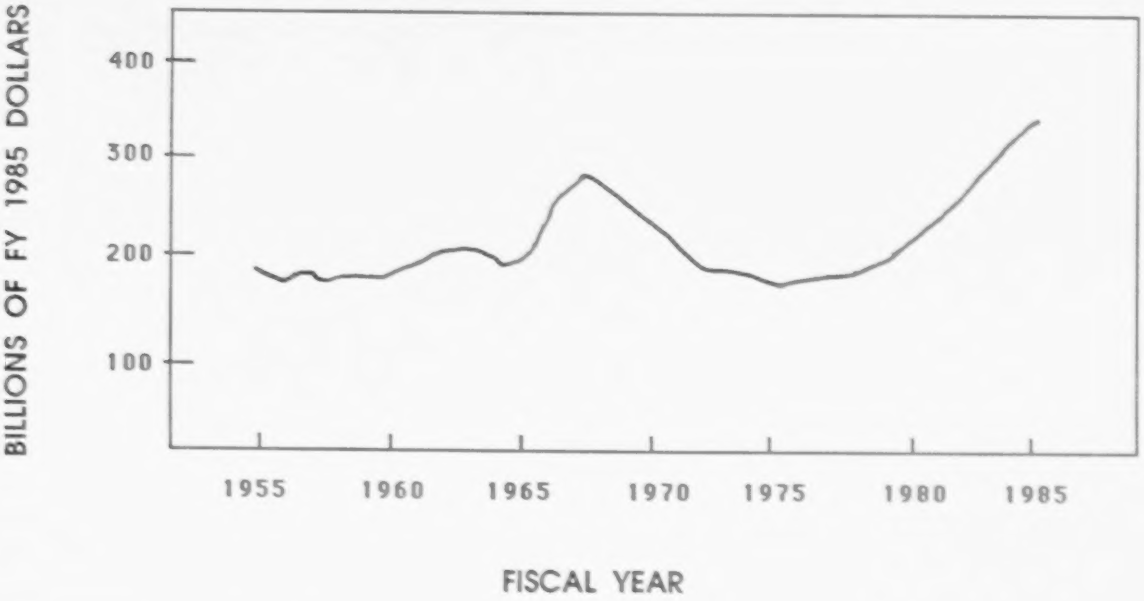
Total Outlays in Constant Dollars

Some economists point out that looking at the total dollars spent by the DoD in a particular fiscal year does not give a true picture of the cost of national security. This is because inflation can distort a comparison of the dollar amounts spent in different years. Inflation means prices are rising. Thus, the dollar cost of providing the same amount of defense will be higher after inflation simply because many of the prices paid for defense items will be higher.

Therefore, to make comparisons more accurate, economists adjust the dollar's value, taking inflation into consideration, and calculate year-to-year defense spending in terms of what they call "constant dollars." In data representing constant dollars the distortion caused by inflation has been taken out.

The graph below presents the total amount in constant dollars spent by the Department of Defense in selected years since 1955. The graph shows spending in terms of the 1985 price level.

DoD Outlays in Constant (FY 1985) Dollars, 1955-85



Questions

3. What was the total amount in "constant dollars" spent by the Department of Defense in each of these years?

1955 $ ______ 1965 $ ______ 1975 $ ______ 1985 $ ______

4. Based on constant dollars spent by the Department of Defense, how would you describe the trend in defense spending over the past 30 years?

________________________________. In the last five years? ______________.

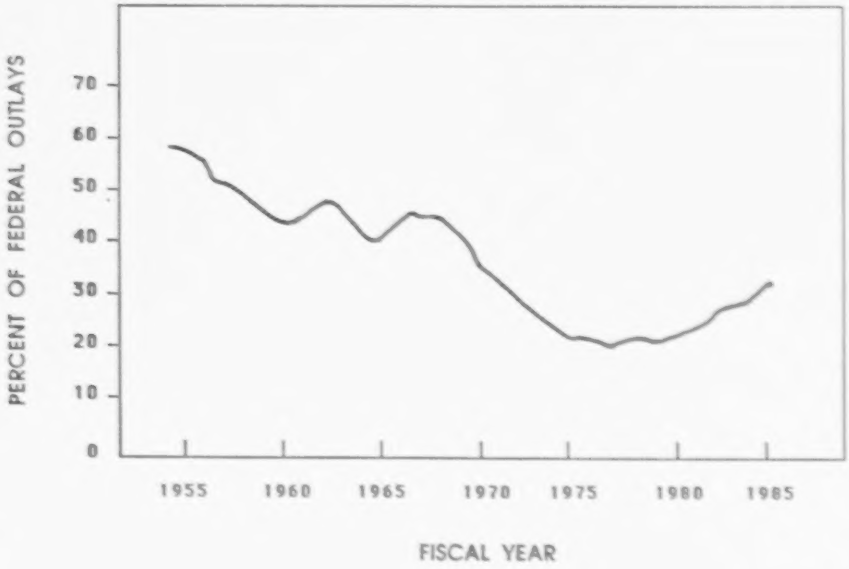
From *Economics and National Security*. Mershon Center, The Ohio State University.

Percentage of Federal Outlays

Some economists do not think using dollars is the best way to judge trends in defense spending. Instead, they consider how much of all the federal government's outlays in any particular fiscal year go to defense. In other words, the cost of defense is calculated as a percentage of all federal expenditures.

The graph below presents the total spent by the Department of Defense in selected years since 1955 as a percentage of total federal spending.

DoD Outlays as a Percent of All Federal Outlays, 1955-85



Questions

5. What was the percent of total federal outlays spent by the Department of Defense in each of these years?

1955 $ _____ 1965 $ _____ 1975 $ _____ 1985 $ _____

6. In which of the years since 1955 has the greatest percent of federal outlays been spent on defense? _____

7. In which of the years since 1955 has the smallest percent of federal outlays been spent on defense? _____

8. Based on defense spending as a percentage of total federal outlays, how would you describe the trend in defense spending over the past 30 years?

_________________________________. In the past five years? _____________.

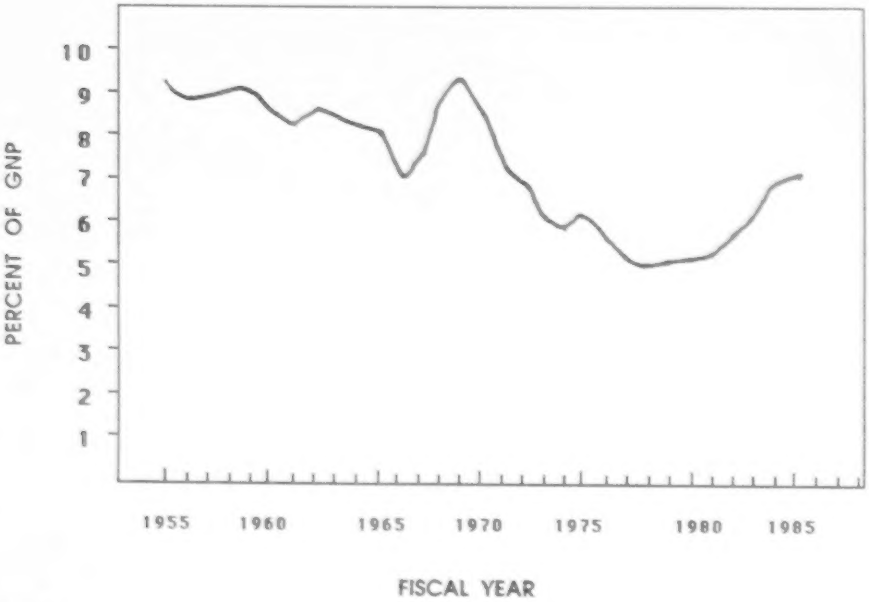
From *Economics and National Security*. Mershon Center, The Ohio State University.

Percentage of Gross National Product (GNP)

A fourth method used by some economists to get a perspective on defense spending is to compare defense spending with non-defense spending. To do this, defense spending is calculated as a percentage of the GNP (Gross National Product). The GNP is a measure of all the goods and services produced for final demand by the United States in a particular year. This method of measuring defense spending indicates how much of the goods and services were related to national security.

The graph below presents the total spent by DoD in selected years since 1955 as a percentage of the total GNP.

DoD Outlays as a Percent of GNP, 1955-85



Questions

9. What was the percent of the GNP that the total spent by the Department of Defense represented in each of these years?

1955 ______% 1965 ______% 1975 ______% 1985 ______%

10. In which of the years since 1955 did defense spending represent the greatest percent of the GNP? ______

11. In which of the years since 1955 did defense spending represent the smallest percent of the GNP? ______

12. Based on defense spending as a percent of the GNP, how would you describe the trend in defense spending over the last 30 years?

__________________________________. In the past five years? ______________.

From *Economics and National Security*. Mershon Center, The Ohio State University.

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